Part 3 Feature Specifications and Compilation

Standards for 1:100,000-Scale Quadrangle Maps

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3. FEATURE SPECIFICATIONS AND COMPILATION

A 1:100,000-scale map is compiled from existing 7.5- and 15-minute maps. This part describes the conditions for extracting features from the source maps to accommodate the reduced scale.

The feature <u>definitions</u> that follow apply to USGS topographic maps of all scales. On the other hand, the <u>qualifying criteria</u> that determine when to select a feature vary based on map scale. This part presents the qualifying criteria that determine when to select a feature that is shown on the source maps for representation at 1:100,000 scale. The qualifying criteria for the 1:24,000- and 1:25,000-scale source maps are also given for reference. These qualifying criteria indicate when features are shown based on such things as feature sizes, relationship to other features, density, and dimensions. Minimum selection sizes and dimensions for features are given in inches and refer to sizes at publication scale.

For the most part, features for which minimum selection sizes have been established are shown only if they exceed the minimum size. In certain cases, features that are smaller than the established minumum selection size may be shown to properly portray an area or to facilitate compilation. Minimum symbol sizes have also been established for features that are always shown. If these features are less than the minimum symbol size, symbols are used that exaggerate the actual ground limits of the feature. Examples of features which are shown with a minimum symbol size if they are too small to plot to scale are highways and buildings.

Definitions are given for features shown on both topographic and topographic/bathymetric editions. Features shown on planimetric editions are identical to the topographic edition except contours are not compiled.

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The symbol specifications used to represent the features described in this part are given in Part 4.

Type sizes and styles for names and labels of mapped features, as well as criteria for when mapped features are named or labelled, are given in Part 5.

3.1 FEATURE DISPLACEMENT CRITERIA

The locations of cultural features may be determined more precisely than those of contours. Many culture symbols are enlarged beyond the actual size of the feature they represent. Because these features frequently determine the shapes and positions of contours and of woodland outlines, they are mapped first. Features are displaced only when necessary because of map scale. The order of importance of positioning and alignment of planimetric detail is as follows:

- 1. Railroads
- 2. Highways
- 3. Roads
- 4. Drainage
- 5. Other miscellaneous data

The true alignment of a railroad is not compromised by highways, roads, buildings, or other adjacent planimetric features except as noted below for closely spaced parallel features. If necessary, such features are displaced and sometimes distorted to provide proper clearance between symbols. The minimum clearance between symbols is 0.005 inch.

The center and orientation of a symbol is positioned to correspond with the center and orientation of the feature presented. All line features such as railroads, highways, roads, powerlines, and streams are plotted in their true positions and retain, wherever scale permits, the variations of alignment which actually exist. Highways, roads, railroads, streams, levees, and like features laying parallel and close to each other may require an exception to the rule. The displacement should be distributed evenly, with the true center of the parallel features, taken collectively, held wherever possible and with contours adjusted to the symbols.

3.2 RAILROADS AND RELATED FEATURES

Railroads are symbolized to reflect gauge, number of tracks, and the operating status. The number of tracks, if more than 2, and operating status are shown by label, and the name of the operating company is shown. The selection of railroads to be mapped is based on the operating status.

3.2.1 Gauge

The gauge is the distance between the rails of a track. A distinction in symbolization is made between the two gauges found in the United States.

- o Standard gauge is a rail separation of 4 feet 8.5 inches.
- o Narrow gauge is any rail separation less than 4 feet 8.5 inches, used mostly on private freight or scenic passenger lines.

When a narrow-gauge railroad occupies the same roadbed as a standard-gauge railroad, only the standard-gauge railroad is symbolized.

3.2.2 Number of Tracks

A distinction in symbolization is made between single- and multiple-track railroads. Sidings are not considered in determining the number of tracks of a railroad.

- o A single-track railroad has one set of tracks.
- o A multiple-track railroad has two or more parallel main-line tracks on the same roadbed.

3.2.3 Operating Status

A distinction in symbolization is made among the four categories that follow.

3.2.3.1 Main-line Railroads

Main-line railroads are railroads that maintain regular or intermittent operating schedules between designated stations. This definition excludes sidings, yards, or spur tracks. Rapid-transit lines designed to carry passengers between urban areas or between a city and outlying communities are mapped as main-line railroads.

1:24,000 and 1:25,000 scale
All main-line railroads are
mapped and symbolized to reflect
gauge and number of tracks.

Only the aboveground portion and tunnel entrances of underground portions of rapid-transit systems are mapped. The underground alignment is not mapped. Selection at 1:100,000 scale Show all main-line railroads. Symbolize according to gauge and number of tracks.

Show the aboveground portion and tunnel entrances of underground portions of rapid-transit systems; do not show the underground alignment. (Plate 112; symbol nos. 11, 12, 13, 14)

3.2.3.2 Railroads Under Construction

A railroad under construction is one on which construction work has already been started. Proposed railroads, including those for which right-of-way has been established are not considered to be under construction.

1:24,000 and 1:25,000 scale
All railroads under construction
are mapped and symbolized to
reflect gauge and number of tracks.

Selection at 1:100,000 scale
Do not show railroads
under construction.

3.2.3.3

Abendoned Railroads

An abandoned railroad is one which is no longer in use, but has ballast, tracks, and bridges substantially intact, and which, with a minimum of repair work, could be put to limited use.

Delete

1:24,000 and 1:25,000 scale
All abandoned railroads are
mapped and symbolized to
reflect gauge and number
of tracks.

Selection at 1:100,000 scale
Show all abandoned reilroads
Symbolise according to gauge
and number of tracks.
(Plate 112; symbol no. 24)

3.2.3.4 Dismantled Railroads

A dismantled railroad is one that has had most of its rails and bridges removed. The remaining evidence of a railroad is primarily the cleared right-of-way.

1:24,000 and 1:25,000 scale
All dismantled railroads that
are at least 0.24 inch long are
mapped using the prescribed
symbol.

Selection at 1:100,000 scale Show all dismantled railroads that are at least 0.63 inch long. (Plate 116; symbol no. 3)

3.2.4 Railroads in Juxtaposition

Railroads in juxtaposition are two railroads of different ownership that occupy the same roadbed.

1:24,000 and 1:25,000 scale
All railroads in juxtaposition
are mapped using the prescribed
symbol. If the distance
between the tracks is too narrow
to plot to scale, the space is
exaggerated to 0.011 inch.

Selection at 1:100,000 scale Show all railroads in juxtaposition with the standard multiple-track symbol. (Plate 112; symbol no. 12)

3.2.5 Railroads in Highways and Roads

1:24,000 and 1:25,000 scale
Only operating railroads in
highways and roads are mapped.
The alignment of non-operating
railroads is dropped when they
enter the highway or road.

Selection at 1:100,000 scale Show all operating railroads in highways and roads. (Plate 112; symbol no. 25)

3.2.6 Carlines

A carline is any type of permanent roadbed with rails that provides a track for light-car units. The cars are designed primarily for suburban or interurban transportation of passengers. The cars, which normally travel as single units, are usually self-propelled. The distinction between the operating status of a carline is the same as for railroads. Gauge and number of tracks are not indicated.

1:24,000 and 1:25,000 scale All operating carlines are mapped outside of houseomission area tints. Upon entering a house-omission area tint, a carline is continued until it becomes coincident with a road. Abandoned carlines are mapped outside of house-omission area tints when the rights-of-way are not in a road. An abandoned carline is dropped at the point where it becomes coincident with a road or enters a house-omission area tint.

Selection at 1:100,000 scale
Show all operating carlines
outside of built-up area tints.
Upon entering a built-up area
tint, continue the carline
until it becomes coincident
with a road. Do not show
abandoned carlines.
(Plate 112; symbol no. 27)

3.2.7 Cog Railways/Incline Railways

A cog railway is designed to operate on steep slopes, having locomotives with a center cogwheel that engages with a cogged center rail to provide traction.

An incline railway is a cable railway operating on steep slopes, generally with simultaneously ascending and descending cars counterbalancing one another.

1:24,000 and 1:25,000 scale Cog and incline railways are distinctive landmarks and are always mapped. Number of tracks are not indicated. Selection at 1:100,000 scale Show all cog and incline railways. Do not indicate number of tracks. (Plate 112; symbol no. 23)

3.2.8 Railroad Yards

A railroad yard is a system of tracks used for assembling and dispatching trains, loading and unloading freight, etc.

1:24,000 and 1:25,000 scale
All railroad yards are mapped and symbolized in true shape and size as defined by the outer tracks. Within the yard, mainline tracks are shown in true position. Other tracks are generalized, but the distinctive pattern of the yard is portrayed.

Selection at 1:100,000 scale
Show all railroad yards in
true shape and size as defined by the outer tracks.
Within the yard, show mainline tracks in true position.
Generalize other tracks, but
maintain the distinctive
pattern of the yard.
(Plate 112; symbol no. 15)

3.2.9 Railroad Sidings and Spur Tracks

A siding is a short track, connected by switches or points with the main track, which allows trains to pass each other or provides a storage place for temporarily idle cars.

A spur track is a track which diverges from the main track and leads to some facility, usually an industrial point.

1:24,000 and 1:25,000 scale
Active sidings and spur tracks
are mapped accurately in length,
but may be displaced if necessary. In congested or urban areas,
minor industrial sidings are omitted
but in sparsely settled areas,
sidings are distinctive landmarks,
often have names, and are always
mapped. When the distance between
the main line and a siding is too
small to plot to scale, the space is
exaggerated to 0.011 inch.

Selection at 1:100,000 scale Show all active sidings and spur tracks that are at least 0.12 inch long. (Plate 112; symbol no. 16)

3.2.10 Roundhouses

A roundhouse is a circular building, built around a turntable, used to service and repair locomotives.

1:24,000 and 1:25,000 scale
All roundhouses are mapped and
and symbolized as Class 1
buildings in true outline and to
scale.

Selection at 1:100,000 scale Show all roundhouses in true outline and to scale. (Plate 112; symbol no. 22)

3.2.11 Turntables

A turntable is a rotating, track-bearing platform, used to turn locomotives and cars around.

1:24,000 and 1:25,000 scale
All turntables are mapped and
plotted to scale. If a turntable is
too small to plot to scale, the circle
is exaggerated to 0.06 inch.

Selection at 1:100,000 scale
Do not show turntables.

3.2.12 Railroad Stations

A railroad station is a building used regularly for receiving or discharging passengers and freight and includes rapid-transit stations. Flag stops, halts, and similar features are shown as stations only if they include a permanent building or structure, such as a platform.

1:24,000 and 1:25,000 scale
All railroad stations are
mapped as Class 1 buildings.

Selection at 1:100,000 scale
Show railroad stations using
the prescribed symbol only
in sparsely settled areas
where location of the station
is not indicated by a siding
or other identifying feature.
(Plate 112; symbol no. 18)

3.2.13 Snowsheds

Snowsheds are structures erected over a road or railroad track designed to protect the right-of-way against blockage by snowslides.

1:24,000 and 1:25,000 scale
These features are distinctive
landmarks and all snowsheds are
mapped if they are long enough to
plot to scale. The width is plotted
to scale if it exceeds the minimum
symbol width of 0.04 inch.

Selection at 1:100,000 scale Show all snowsheds that are at least 0.12 inch long. (Plate 112; symbol no. 26)

3.2.14 Railroad Bridges, Overpasses/Underpasses, Tunnels, and Ferries

3.2.14.1 Bridges

A bridge is a structure that spans and provides passage over a river, stream or open body of water. Viaducts, which are structures erected over a depression, valley, or gorge, or over areas of heavy cultural density to serve as a crossing for railroad or vehicular traffic, are treated as bridges. Short viaducts that allow two roads or a road and a railroad to cross are treated as overpasses and are discussed in section 3.2.14.3.

1:24,000 and 1:25,000 scale
Drawbridges, historically
significant bridges, covered, and
named bridges are mapped
regardless of length. Other bridges
that are at least 0.12 inch long
are mapped.

Selection at 1:100,000 scale Show all bridges that are at least 0.12 inch long. (Plate 112; symbol no. 17)

3.2.14.2 Tunnels

A tunnel is an underground passageway through or under an obstruction. Short tunnels which allow two roads or a road and a railroad to underpass, are treated as underpasses and are discussed in section 3.2.14.3.

1:24,000 and 1:25,000 scale
All tunnels that are at least
0.12 inch long are mapped.

Underground railroads are mapped using the railroad tunnel symbol if they can be shown legibly. If the alignment is unknown, the tunnel alignment is omitted, but the wing ticks are shown.

Only the aboveground portion and tunnel entrances and exits for underground portions of rapidtransit systems are mapped. The underground alignment is not mapped. Selection at 1:100,000 scale Show all tunnels that are at least 0.12 inch long

Show underground railroads using the railroad tunnel symbol if they can be shown legibly. If the alignment is unknown, omit the tunnel alignment but show the wing ticks.

Show the aboveground portion and tunnel entrances and exits for underground portions of rapid-transit systems; do not show the underground alignment. (Plate 112; symbol no. 19)

3.2.14.3 Overpasses/Underpasses

Overpasses/underpasses are separations of the surface levels of intersecting roads and railroads or a road and a railroad.

1:24,000 and 1:25,000 scale
All overpasses/underpasses are indicated. Elevated railways that are at least 0.12 inch long are mapped as viaducts.
(see section 3.2.14.1).

Selection at 1:100,000 scale Indicate all overpasses/underpasses. Treat elevated railways that are at least 0.12 inch long as viaducts. (see section 3.2.14.1). (Plate 112; symbol no. 20)

3.2.14.4 Ferries

Ferries are boats used to transport traffic (pedestrian or vehicular) between two points separated by water.

1:24,000 and 1:25,000 scale
All ferry routes are mapped.

Selection at 1:100,000 scale
Show all ferry routes that are
at least 0.12 inch long using the
prescribed symbol and label.
Indicate ferry routes less than
0.12 inch long by label only.
(Plate 112; symbol no. 21)

3.3 HIGHWAYS, ROADS, AND RELATED FEATURES

Highways and roads are among the most important features shown on topographic maps and they must be portrayed accurately and clearly. Most roads are shown, consistent with map legibility and density of cultural development, based on the following specifications.

3.3.1 Road Classification

A distinction in symbolization is made among the five highway and road classes based on their design, on their weatherability, on their governmental designation and on the Department of Transportation functional classification system.

- o Hard-surface construction is generally concrete, asphaltic concrete, or bituminous macadam. Surfaces are waterproof.

 Minimum maintenance is required.
- o Improved, loose-surface construction is on a light foundation and is usually gravel or stone surface, or of some stable material, such as selected sand-clay, treated oil gravel, or light tar-bound macadam. The roads are generally drained and graded, but the surface is not waterproof. Periodic maintenance is required.
- o Unimproved-surface construction is usually stablilized soil, sand-clay or disintegrated rock with poor or no foundation. The road is sometimes drained or graded. If the roads are maintained at all, continual maintenance is required.

3.3.1.1 Primary Highways (Class 1)

Primary highways are hard-surface highways including Interstate and U.S. numbered highways (including alternates), primary State routes, and all controlled-access highways.

1:24,000 and 1:25,000 scale
All primary highways are mapped.
They are symbolized to scale if they exceed the minimum symbol width of 0.02 inch. Road width is determined as the width of the traffic surface excluding shoulders or, for city streets, the distance from curb to curb. Variations in road width are shown if they are at least 1.0 inch long, or one full block in urban areas.

Selection at 1:100,000 scale
Show all primary highways.
In order to avoid excessive
displacement, while continuing to show all highways,
symbolize primary highways
that parallel interstate or
other controlled access
divided highways as Class 2.
(Plate 121; symbol no. 1)

3.3.1.2 Secondary Highways (Class 2)

Secondary highways are hard-surface highways including secondary State routes, primary county routes, and other highways that connect principal cities and towns, and link these places with the primary highway system. A road must be at least 16 feet wide to be classified as Class 2.

1:24,000 and 1:25,000 scale
All secondary highways are
mapped. They are symbolized
to scale although they rarely
exceed the minimum symbol size.

Selection at 1:100,000 scale Show all secondary highways. (Plate 121; symbol no. 2)

3.3.1.3 Light-duty Roads (Class 3)

Class 3 roads are hard-surface roads not included in a higher class and improved, loose-surface roads passable in all kinds of weather and used mostly for local traffic. These roads are adjuncts to the primary and secondary highway systems. Also included are important private roads such as main logging or industrial roads which serve as connecting links to the regular road network.

1:24,000 and 1:25,000 scale
All Class 3 roads are mapped.
(See section 3.3.2, Streets, and section 3.3.6.2, Private Roads for additional criteria.)

Selection at 1:100,000 scale Show all Class 3 roads outside of built-up areas. (See section 3.3.2, Streets, and section 3.3.6.2, Private Roads for additional criteria.) (Plate 116; symbol no. 1)

3.3.1.4 Unimproved Roads (Class 4)

Unimproved roads are roads which are generally passable only in fair weather and used mostly for local traffic.

1:24,000 and 1:25,000 scale Not all unimproved roads are mapped. Whether an unimproved road is mapped depends on its local importance as a travel route. In general, unimproved roads are mapped if they provide access to a mapped feature, or if they are at least 0.24 inch long and provide the only access to an isolated area. If several unimproved roads lead to the same feature, only the best or most direct roads are mapped. The amount of cultural detail must be considered, particularily in areas with a dense network of unimproved roads. To map such an area legibly, only the best and most direct routes are mapped. However, in recreational and undeveloped areas where travel routes are important, all roads are mapped.

Selection at 1:100,000 scale
Show all connecting unimproved roads and those that lead to a mapped feature.
Show all dead-end unimproved roads that are at least 0.24 inch long.
(See section 3.3.2, Streets, and section 3.3.6.2, Private Roads for additional criteria.
(Plate 116; symbol no. 2)

3.3.1.5 Trails and Special Service Roads (Class 5)

This classification includes foot trails, pack trails, ski trails, one-lane roads on levees, maintenance roads along transmission lines, roads passable only with 4-wheel-drive vehicles, and dismantled railroads.

1:24,000 and 1:25,000 scale All trails that are at least 0.24 inch long are mapped except for minor, poorly maintained trails or trails intended for private use only. Maintenance roads along pipelines or power transmission lines are mapped if they provide the only access to isolated areas. Trail forks are important landmarks and are mapped even if the minor branching trail is not. When the minor branch is not mapped, the fork is indicated by two standard-length dashes of the trail symbol.

Selection at 1:100,000 scale Show all trails and special service roads that are at least 0.63 inch long. (Plate 116; symbol no. 3)

3.3.2 Streets

Roads that are laid out in a systematized pattern to accommodate residential or industrial development are classified as streets.

1:24,000 and 1:25,000 scale
All streets in house-omission
area tints are mapped according to standard classification
procedures, regardless of length.
Named alleys that provide the
only access to residential or
business buildings are mapped
as any other streets, but are
shown with a reduced symbol width
of 0.015 inch.

In populated places outside houseomission area tints, streets are mapped according to their physical condition at the time of field classification. Selection at 1:100,000 scale Show entire street pattern as follows:

Show all Class 1 and 2 highways. Show other principal through routes using the symbol for Class 3 roads. Principal through routes are determined by the logical continuity of streets connecting with the main roads leading into the built-up area. Show the remaining street pattern using the symbol for Class 4 roads. Do not show alleys (Plate 116; symbol no. 7)

3.3.3 <u>Highways Under Construction or Proposed</u>

A road is considered under construction when work is actually started on the right-of-way. Roads under repair are not considered to be under construction.

A proposed road is a road for which the right-of-way has been acquired but construction has not been started.

1:24,000 and 1:25,000 scale

If the completion date is unknown, the highway is mapped using the prescribed symbol. If the highway is expected to be completed by the time the map is published, or within a reasonable time afterwards, the road is mapped as a completed road.

A proposed highway is mapped if the State highway department supplies detailed route and construction plans, along with a statement that the proposed highway should be shown. Only proposed Class 1 highways are mapped. Selection at 1:100,000 scale Show only Class 1 highways under construction. Do not show proposed highways. (Plate 121; symbol no. 3)

3.3.4 <u>Dual Highways</u>

Dual highways have opposing traffic lanes physically separated by curbs or median strips.

1:24,000 and 1:25,000 scale For dual Class 1 and 2 highways with an overall width (including median) of at least 0.037 inch, if the median strip is greater than 0.01 inch, each roadway is mapped as an individual road and symbolized to scale if it exceeds the minimum symbol width. If the median strip is 0.01 inch or less, the highway is mapped and symbolized using three casings with the roadways slightly widened to preserve the position of the outer limits. Dual Class 1 and 2 highways less than 0.037 inch are exaggerated and symbolized with three casings, using the minimum symbol width of 0.037 inch, regardless of the width of the median strip.

For dual Class 3 roads, if the median strip is greater than 0.01 inch, each roadway is mapped as an individual road and symbolized to scale if it exceeds the minimum symbol width. If the median strip is 0.01 inch or less, the road is mapped and symbolized as a standard Class 3 road.

Selection at 1:100,000 scale
Show Class 1 and Class 2
highways as dual highways if the median strip is at least 0.024 inch wide.
(Plate 121; symbol nos. 1 and 2)

3.3.5 Number of Lanes

1:24,000 and 1:25,000 scale
The number of lanes marked
by stripes or signs or, if
unmarked, designated by
highway authorities is used.
Road width is not a determining
factor.

If there are more than 2 lanes, the number of lanes is shown by a label, and points of change are indicated. Variations in number of lanes are not shown unless they are at least 1.3 inch long.

Highways with plotted median strips are labelled, if more than two lanes, to indicate the number of lanes in either direction, with arrows showing the direction of flow. Selection at 1:100,000 scale

Do not indicate number of lanes.



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3.3.6 Roads with Traffic Restrictions

3.3.6.1 Access Roads

Access roads are roads that provide access to cemeteries, parks, and other similar enclosed areas.

1:24,000 and 1:25,000 scale Access roads are mapped if that are at least 0.24 inch long, according to standard classification procedures. Selection at 1:100,000 scale Show all access roads that are at least 0.24 inch long according to standard classification procedures.

3.3.6.2 Private Roads

Private roads are those maintained by private funds and which are not normally open to the public.

1:24,000 and 1:25,000 scale
A private road is mapped in accordance with standard classification procedures if it is at least 0.24 inch long. In addition, Class 3 or higher private roads are labelled if they have locked gates or posted entrances and could be misinterpreted as being part of the public road system. Class 4 private roads are not labelled. Driveways are symbolized as Class 4 regardless of their construction.

Selection at 1:100,000 scale
Show all private roads that
are at least 0.24 inch long
according to standard classification procedures. Do not
label. Symbolize driveways
that are at least 0.24 inch long
as Class 4 roads regardless of
their construction.

3.3.6.3 Restricted Roads

Restricted roads are designated for official use only and are found in national parks, national forests, and military reservations and are closed to general use. Roads closed periodically for firing practice on military reservations are shown as restricted.

1:24,000 and 1:25,000 scale Restricted roads are mapped according to standard classification procedures and are indicated by gate and label. Selection at 1:100,000 scale

Do not show restricted roads

3.3.6.4 Toll Roads

Toll roads are roads for which a toll is charged.

1:24,000 and 1:25,000 scale
Toll roads are mapped in
accordance with standard
classification procedures
and labelled. All tollgates
are shown using the prescribed symbol.

Selection at 1:100,000 scale
Show all toll roads according to standard classification procedures and label. Do not show tollgates.

Roads Associated with Service, Rest, or Other Pull-off Areas

These are roads that provide access to service facilities such as service stations, weigh stations, comfort stations, and restaurants that are designed to serve users of controlled access highways. Also included are rest areas on other highways consisting of comfort stations and surfaced parking areas. Other pull-off areas have definite entrance and exit points and are separated from the roadway and include scenic overlooks and picnic areas.

1:24,000 and 1:25,000 scale
Roads for all service, rest, or
other pull-off areas whose location and operation are controlled by the responsible
highway authority are mapped.
Those on Class 1 and 2
highways are labelled.

Selection at 1:100,000 scale Show roads for all service, rest or other pull-off areas if they are large enough to plot to scale without displacing other features. (Plate 121; symbol no. 9: Plate 116; symbol no. 8)

3.3.7 Road Intersections

3.3.7.1 Interchanges

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An interchange is a system of access roads designed to facilitate entrance or exit between merging or intersecting highways.

1:24,000 and 1:25,000 scale
All interchanges are mapped and delineated as built.
Access ramps may be shown with a minimum symbol size of 0.015 inch to avoid displacement. Ramps are classified consistent with the highest class highway in the interchange.

Selection at 1:100,000 scale Show all interchanges as built. Ramps are classified consistent with the highest class highway in the interchange. (Plate 121; symbol no. 5)

3.3.7.2 Highway Islands

A highway island is a road intersection that forms a triangular island.

1:24,000 and 1:25,000 scale
Highway islands are mapped
and delineated as built if the
shortest dimension is at least
0.02 inch. If a highway island is
smaller than 0.02 inch, the island is
dropped, preserving the position of
the outer limits of the roadways.

Selection at 1:100,000 scale
Show highway islands that are
large enough to plot to scale
without displacing other features.
If a highway island is too small
to plot to scale, drop the island.

3.3.7.3 Traffic Circles

A traffic circle is a junction of roads that form a circle around which traffic normally moves in one direction.

1:24,000 and 1:25,000 scale
Traffic circles that are large
enough to plot to scale without
displacing other features are
mapped. If the road in a traffic
circle is cased, the inner casing
is dropped when the resulting inner
diameter would be less than 0.02
inch, preserving the position of
the outer limits of the circle.
Traffic circles receive the
classification and are symbolized
according to the highest class
road that enters the circle.

Selection at 1:100,000 scale
Show traffic circles that
are large enough to plot to
scale without displacing
other features. Use classification of the highest class
road that enters a traffic
circle. Use reduced lineweight
of 0.007 for a road in a traffic
circle.
(Plate 121; symbol no. 10:

Plate 116; symbol no. 10)

3.3.7.4 Dead-End Highways, Roads, and Streets

A dead-end highway, road, or street is a roadway closed at one end which may or may not include a turn-around or cul-de-sac.

1:24,000 and 1:25,000 scale

Highways and roads that dead-end
at a highway, railroad, or fill
are closed off using the prescribed symbol so that they
will not be confused with
an underpass.

Cul-de-sacs that can be plotted
to scale without displacing other
features are mapped. If the
road is cased, the inner
casing is dropped when the
resulting inner circle diameter
would be less than 0.02 inck.

Selection at 1:100,000 scale

Do not close off dead-end roads.

Show cul-de-sacs that can be plotted to scale without displacing other features. Do not exaggerate. Do not show culde-sacs less than 0.025 inch. (Plate 121; symbol no. 10: Plate 116; symbol no. 10)

3.3.8 Highway and Road Bridges, Overpasses, Tunnels, Ferries, and Fords

3.3.8.1 Bridges

A bridge is a structure that spans and provides passage over a river, stream or open body of water. Viaducts, which are structures erected over a depression, valley, or gorge, or over areas of heavy cultural density to serve as a crossing for railroad or vehicular traffic, are symbolized with the bridge symbol. Short viaducts that allow two roads or a road and a railroad to cross are treated as overpasses and are discussed in section 3.3.8.3.

1:24,000 and 1:25,000 scale
Drawbridges, historically
significant bridges, covered, and
named bridges are mapped
regardless of length. Other
bridges that are at least 0.12
inch long are mapped.
All footbridges are mapped.

Selection at 1:100,000 scale Show all bridges that are at least 0.12 inch long. Do not show footbridges. (Plate 121; symbol no. 8: Plate 116; symbol no. 6: Plate 112; symbol no. 83)

3.3.8.2 Tunnels

A tunnel is an underground passageway through or under an obstruction. Short tunnels which allow two roads or a road and a railroad to underpass, are treated as underpasses and are discussed in section 3.3.8.3.

1:24,000 and 1:25,000 scale
All tunnels that are at least
0.12 inch long are mapped.

Selection at 1:100,000 scale Show all tunnels that are at least 0.12 inch long (Plate 121; symbol no. 7: Plate 116; symbol no. 5: Plate 112; symbol no. 83)

3.3.8.3 Overpasses/Underpasses

Overpasses/underpasses are separations of the surface levels of intersecting roads and railroads or a road and a railroad.

1:24,000 and 1:25,000 scale
All overpasses/underpasses are indicated. Blevated roadways that are at least 0.12 inch long are mapped as viaducts (see section 3.3.8.1).

Indicate all overpasses/underpasses. Treat elevated roadways that are at least 0.12 inch long as viaducts (see section 3.3.8.1). (Plate 121; symbol no. 6: Plate 116; symbol no. 4)

3.3.8.4 Ferries

Ferries are boats used to transport traffic (pedestrian or vehicular) between two points separated by water.

1:24,000 and 1:25,000 scale
All ferry routes are mapped.

Selection at 1:100,000 scale
Show all ferry routes that are
at least 0.12 inch long using the
prescribed symbol and label.
Indicate ferry routes less than
0.12 inch long by label only.
(Plate 112; symbol no. 84)

3.3.8.5 Road Fords

A ford is a shallow place in a body of water where a crossing can be made without benefit of a bridge.

1:24,000 and 1:25,000 scale
All fords across double-line
streams are mapped. Fords
across single-line streams are
shown for Class 3 roads only.

Selection at 1:100,000 scale Label fords as space permits.

3.3.9 Double-deck Highways

1:24,000 and 1:25,000 scale
All double-deck structures,
where one road is constructed
over another, are mapped.
If the lower road is wider than
the upper road, both roads are
mapped and labelled. If the lower
road is the same width or narrower
than the upper road, only the upper
road is mapped and labelled.

Selection at 1:100,000 scale Do not indicate double-deck highways.

3.3.10 Snowsheds

Snowsheds are structures erected over a road or railroad and designed to protect the right-of-way against blockage by snowslides.

1:24,000 and 1:25,000 scale
These features are distinctive
landmarks and all snowsheds are
mapped if they are long enough to
to plot to scale. The width is
plotted to scale if it exceeds
the minimum symbol width of
0.04 inch.

Selection at 1:100,000 scale Show all snowsheds that are at least 0.12 inch long. (Plate 112; symbol no. 85)

3.3.11 Boat Ramps

1:24,000 and 1:25,000 scale All boat ramps are mapped. Selection at 1:100,000 scale Do not show boat ramps.

3.3.12 Parking Lots

1:24,000 and 1:25,000 scale
Parking lots that are at least
0.12 inch in the shortest dimension and are not directly
adjacent to the building they
serve, are mapped. Parking lots
for large stadiums and commuter
park and ride locations are also
mapped.

Selection at 1:100,000 scale
Do not show parking lots

3.3.13 Racetracks/Raceways

1:24,000 and 1:25,000 scale All racetracks/raceways are mapped. Selection at 1:100,000 scale
Show all racetracks/raceways
that can be shown to scale
without displacing other
features.
(Plate 116; symbol no. 9)

3.4 BUILDINGS AND RELATED FEATURES

Not all buildings can be mapped legibly, and various means must be used to simplify the map representation. Some kinds of buildings are omitted, some buildings are shown larger than their true size, and sometimes only landmark buildings are mapped.

3.4.1 <u>Building Selection and Symbolization</u>

No distinction in symbolization is made between building classes.

1:24,000 and 1:25,000 scale In open areas: Buildings, except those smaller than the average local dwelling, such as sheds and private garages, are mapped wherever they exist by properly oriented individual building symbols. The center of the symbol is positioned over the center of the feature. When the building is larger than the minimum symbol size, it is mapped to scale. Mobile homes are mapped only if they are on permanent foundations.

Selection at 1:100,000 scale
In open areas: Show only
landmark buildings. A
landmark is one that is
conspicuous because of its
size, shape, height, position,
isolated location, or
unusualness to an area. These
include industrial or
commercial complexes,
prominent factories,
communication centers,
prisons, and ranger stations.
(Plate 112, symbol no. 1)

In house-omission area tints: Only important buildings are mapped (see section 3.5.2.2).

In built-up area tints:
Show only universities,
colleges, hospitals, and other
prominent landmark buildings
(see section 3.5.2.2).

3.4 BUILDINGS AND RELATED FEATURES

Not all buildings can be mapped legibly, and various means must be used to simplify the map representation. Some kinds of buildings are omitted, some buildings are shown larger than their true size, and sometimes only landmark buildings are mapped.

3.4.1 Building Selection and Symbolization

No distinction in symbolization is made between building classes.

1:24,000 and 1:25,000 scale In open areas: Buildings, except those smaller than the average local dwelling, such as sheds and private garages, are mapped wherever they exist by properly oriented individual building symbols. The center of the symbol is positioned over the center of the feature. When the building is larger than the minimum symbol size, it is mapped to scale. Mobile homes are mapped only if they are on permanent foundations.

Selection at 1:100,000 scale In open areas: Show only landmark buildings. A landmark is one that is conspicuous because of its size, shape, height, position, isolated location, or unusualness to an area. These include industrial or commercial complexes, prominent factories, communication centers, prisons, and ranger stations. (Plate 112, symbol no. 1)

<u>In house-omission area tints:</u> Only important buildings are mapped (see section 3.5.2.2). In built-up area tints:
Show only universities,
colleges, hospitals, and other
prominent landmark buildings
(see section 3.5.2.2).

1:24,000 and 1;25,000 scale

In congested areas: In areas containing class 1 buildings of approximately the same size, all buildings may be mapped by using the minimum size symbol to avoid omitting any buildings. If space is limited in a block containing one or more large buildings and several smaller ones, the large buildings are plotted to scale and the smaller buildings are omitted as necessary.

The minimum clearance between symbols is 0.005 inch.

Small wings, bays, and projections may be disregarded in buildings of irregular shapes, but the general outline must be preserved.

A group of attached row houses and abutting business buildings that form a continuous structure are mapped as a single building.

When space does not permit all the buildings to be shown in a row of detached buildings, the end buildings are mapped in their true location with a representative number of buildings shown between them. The first building on either side of an open space is considered an end building. In blocks that are almost completely filled, the location of vacant lots and open spaces are preserved.

Selection at 1:100,000 scale
In congested areas: Show only
universities, colleges,
hospitals, and other
landmark buildings prominent
in the area (see section
3.5.2.2).

If not all buildings in a group of buildings can be mapped in true position, the buildings outlining the group are shown, but the interior is simplified. The pattern reflects the extent of the building cluster, the relative space between buildings, and their general orientation.

Mobile home parks are defined as developments designed for permanently placed mobile homes. Mobile homes are mapped if on permanent foundations. Recreational trailers and trailer homes in short-term trailer parks are not mapped. Only paved driveways and permanent buildings are mapped in trailer parks.

1:24,000 and 1:25,000 scale
Churches and Schools:
Religious institutions
including churches,
cathedrals, mosques, temples,
synagogues, convents,
monasteries, and other similar
institutions are mapped by
using the cross symbol.
Buildings used for church
services, either on a
temporary or permanent basis,
that were not designed for
churches are not mapped as
churches.

Public and private colleges, universities and schools (public, parochial, boarding, and preparatory schools) are always mapped by using the flag symbol. Extension schools occupying part of a building, commercially sponsored industrial schools,

Selection at 1:100,000 scale Do not show churches and schools.

> business or trade schools, dancing schools, and temporary schools are not mapped by using the flag symbol.



3.5 POPULATED PLACES AND LOCALES

Populated places have a permanent human population and include cities, towns, villages, and settlements and vary widely in size and density. A locale is a place at which there is or was relatively minor human occupation or activity. A locale may be a railroad siding, station, junction, site, camp, landing, battlefield, crossroad, ranch, farm, windmill, tower, ruins, or ghost town, but does not include populated places, mines, or dams. Populated places and locales are mapped to represent such things as population and relative density and size of buildings and streets. Populated places and locales are represented by distinctive type for names (based on population), use of urban area tints, and locality dots.

3.5.1 Populated Place Classification

Populated places are classified according to population. They are named by using distinctive type sizes. See Part 5, Typography, for type style, sizes, and placement.

Population is derived from Bureau of the Census publications, supplemented with the Rand McNally Commercial Atlas.

| 1:24,000 and 1:25,000 scale | Selection at 1:100,000 scale |
|-------------------------------|------------------------------|
| 250,000 and up | 500,000 and up |
| 25,000 - 249,999 | 100,000 - 499,999 |
| 10,000 - 24,999 | 50,000 - 99,999 |
| 5,000 - 9,999 | 25,000 - 49,999 |
| 2,500 - 4,999 | 5,000 - 24,999 |
| 1,000 - 2,499 | 1,000 - 4,999 |
| 41 houses to 1,000 population | 500 - 999 |
| Compact community of 5-40 | up to 499 |
| houses | Locale |
| Community up to 5 houses, | |
| crossroads, siding | |

3.5.2 Built-Up Area

Built-up area tints are used to indicate concentrated portions of populated places. The degree of building density, street patterns, and the extent of the area are the main criteria used to determine when an area is to be shown by a built-up area tint.

1:24,000 and 1:25,000 scale
House-omission area tints are
used in congested areas where
all buildings cannot be shown
in true position. This occurs
when buildings are closely
spaced, building spaces are
apparently filled, and
additional construction is not
likely to occur.

House-omission area tints are used when the congested area is at least 1.30 inch by 1.30 inch or its equivalent area, providing the shortest dimension exceeds 0.50 inch. Adjacent islands are shown if they exceed 0.65 inch in the shortest dimension.

The limits of the houseomission area tints are
delineated whenever possible
to coincide with mapped
linear features such as
streams, roads, streets, and
railroads. Where the limits
are not coincident with linear
features, the outline is
delineated to create an
accurate portrayal of the
populated place; the final
limiting line is adjusted to
eliminate small indentions or
extensions.

Selection at 1:100,000 scale
Use the built-up area tint for
populated places that have a
definite street pattern and
are at least 0.75 inch by 0.75
inch or its equivalent area,
providing the shortest
dimension exceeds 0.50 inch.
Show adjacent islands if they
exceed 0.25 inch in the
shortest dimension.
(Plate 115, symbol no.1)

Do not use built-up area tint in speculative areas that may have an extensive, welldeveloped street pattern, but few if any actual houses or buildings.

> Narrow strips connecting suburbs to the main area or extending outward along main highways should not be tinted.

Factory complexes, refineries, railroad yards, port facilities, and similar building complexes that have extensive areas of open ground and are found along the periphery of populated places are not included in the houseomission area tint. These features are shown by their appropriate symbol.



3.5.2.1 Open Areas Within Built-Up Area Tints

1:24,000 and 1:25,000 scale
House-omission tints are
always omitted from parks and
cemeteries, regardless of
size, and from open water
features such as lakes, ponds,
reservoirs, and double-line
streams.

House-omission tints are also omitted over features that have well-defined boundaries and open grounds that are at least 0.10 inch in the shortest dimension. The grounds may be occupied by a college, school, factory, hospital, church, or large shopping center. Buildings or other features in these open areas are mapped as individual buildings or by the appropriate symbol.

Selection at 1:100,000 scale Omit built-up area tints from parks, cemeteries, and open water features.

3.5.2.2 Buildings in Built-Up Area Tints

1:24,000 and 1:25,000 scale
In house-omission area tints,
only those buildings that have
particular importance because
of their public function,
historical association,
distinctive physical
appearance, or value as a
reference point are mapped.
Examples of important
buildings that are mapped in
house-omission area tints
include:

Auditoriums Medical ctrs
Armories Memorials
Bus terminals Mosques

Selection at 1:100,000 scale
In built-up area tints show
only universities, colleges,
and hospitals, and other
landmark buildings prominent
in the area, such as capitols,
custom houses, museums, major
auditoriums, stadiums, and so
on, without creating
congestion.

Capitols Museums
Churches Post offices
City/town halls Pvt schools
Community ctrs Public schools
Courthouses R.R. Stations
Firehouses Stadiums
Hospitals Synagogues
Libraries Universities



3.5.3 <u>Village or Locality Dots</u>

1:24,000 and 1:25,000 scale Locality dots are not used.

Selection at 1:100,000 scale
Show locality dots to indicate
locations of small populated
places that are too small to
show a street pattern and are
not located at a road
intersection.
(Plate 112, symbol no. 42)

3.6 MISCELLANEOUS CULTURE

Cultural features refer to those features on the terrain that are the results of the workings of man. This section does not cover Railroads and Related Features, which are discussed in section 3.2; Roads and Related Features, which are discussed in section 3.3; Buildings and Related Features, which are discussed in section 3.4; and Populated Places, which are discussed in section 3.5.

The amount of cultural features in an area is directly related to the physical nature and economic development of the area. Where possible, all miscellaneous cultural features are shown. Where selectivity is required because of the density of detail, features that have landmark significance are always retained. A landmark is any feature of sufficient interest or prominence in relation to its surroundings to make it outstanding as an orientation point for the determination of a location from the air or the ground.

Labels required for Miscellaneous Culture features are on plate 114.



3.6.1 <u>Transmission Lines, Pipelines and Related Features</u>

These features are shown because of their landmark character not because they are transportation or communication routes. They are mapped when they are prominent in relation to their surroundings. Lines are mapped in open country and dropped as they approach congested areas where they lose their value as landmarks and where they cannot be shown without overcrowding the map. Lines are dropped in open country if their routes coincide with, or closely parallel, more important linear features such as roads or railroads.

3.6.1.1 Power Transmission Lines

Power transmission lines are continuous conductors supported on poles or towers used to transmit high-voltage electricity from a generating source to a substation or between substations.

1:24,000 and 1:25,000 scale
Transmission lines that are
supported by steel or concrete
towers or double wooden poles
are mapped as landmark lines.
They need not be mapped as
continuous lines. However,
through open country, they
should be mapped as continuous
lines and dropped or
interrupted only for a logical
reason.

Single pole lines are mapped if they cross areas devoid of other well-defined features. Examples include lines which run across mountainous terrain not parallel to a road or other linear feature, and lines which cross valleys and canyons.

Selection at 1:100,000 scale Show transmission lines if they run for long distances across open or wooded areas, mountainous terrain, valleys and canyons, but not parallel to roads or other linear features. (Plate 112, symbol no. 55)

Steel towers that can be plotted in true position are symbolized by small squares. All steel towers that are located at angle points; on ridge lines; when they straddle important linear features, such as double-line streams, roads, railroads, or boundaries; and at terminating points, such as generating stations and substations are mapped using the small squares.



3.6.1.2 Substations

A substation is an assembly of equipment in an electric power system through which electrical energy is passed for transmission, transformation, distribution, or switching.

1:24,000 and 1:25,000 scale
All substations that are
located outside of houseomission area tints are
mapped. If the substation is
larger than the minimum symbol
size,it is mapped to scale.

Selection at 1:100,000 scale
Show all substations which are
larger than the minimum size
if they are adjacent to mapped
transmission lines and if they
can be plotted to scale
without displacing other
features.
(Plate 112, symbol no. 56)

3.6.1.3 Pipelines (other than water)

A pipeline is a closed pressure conduit used to convey gases, slurries, or liquids. It is composed of sections of pipe that may be on, above, or below the ground surface or submerged. See sections 3.7.6.3 for water pipelines and 3.7.10.6 for offshore pipelines.

1:24,000 and 1:25,000 scale Pipelines with cleared rightsof-way or other visible ground scars are mapped as landmark lines. Surface indications of underground pipelines frequently disappear where the pipelines cross congested or highly developed agricultural areas. Pipelines need not be mapped as continuous lines. However, through open country, they should be mapped as continuous lines and dropped or interrupted only for logical reasons.

Selection at 1:100,000 scale Show pipelines if they run for long distances across open or wooded areas, mountainous terrain, valleys and canyons, but not parallel to roads or other linear features. (Plate 112, symbol no. 58)

3.6.1.4 Pumping Stations

A pumping station is a structure which houses the machinery used to raise the level of a fluid system.

1:24,000 and 1:25,000 scale All pumping stations are mapped. Selection at 1:100,000 scale Show all pumping stations larger than the minimum size of 0.02 by 0.02 inch. (Plate 112, symbol no. 7)

3.6.1.5 Telephone and Telegraph Lines

1:24,000 and 1:25,000 scale
Telephone and telegraph lines
are mapped only if they run
for long distances across
grazing or other open areas,
mountainous terrain, or
valleys and canyons, and if
they are not parallel to roads
or other linear features.

Selection at 1:100,000 scale
Show telephone and telegraph
lines if they run for long
distances across grazing or
other open areas, mountainous
terrain, or valleys and
canyons, and if they are not
parallel to roads or other
linear features. Place squares
at points of pronounced
directional change and space
appropriately between such
points.
(Plate 112, symbol no. 54)

Underground cables are not mapped.

Do not show underground cables.

3.6.1.6 Ski Lifts, Tramways, Monorails

These are linear features usually above ground level that are supported by towers, pylons, or similar structures and used to transport people or material.

1:24,000 and 1:25,000 scale These features are distinctive landmarks and are always mapped. Selection at 1:100,000 scale Show all ski lifts, tramways and monorails over the minimum size of 0.5 inch. (Plate 112, symbol no. 59)

3.6.2 Caves, Mines, and Related Features

3.6.2.1 Caves

A cave is a natural cavity, recess, chamber or series of chambers and galleries beneath the surface of the earth, within a mountain or ledge of rocks, etc.

1:24,000 and 1:25,000 scale
Only those caves that are well
known and are protected and
controlled by a Federal,
State, or local organization
for educational purposes, or
those that are exceptionally
prominent and have physical
landmark value, are mapped.

Selection at 1:100,000 scale Show all caves that are named on the source maps. (Plate 112, symbol no. 35)

3.6.2.2 Open-Pit Mines, Quarries, and Other Excavations

These features are usually depressions, but they may be sidehill benches and include:

<u>Open-pit mines</u> - excavations from which large deposits of mineral ores such as copper and iron ore are removed.

Quarries - excavations in solid rock from which building stone, limestone, slate, and other similar materials are removed. The stone may require physical alteration such as crushing or washing before use. These features include workings where limestone is removed for the manufacture of cement.

<u>Pits</u> - open excavations in unconsolidated material from which gravel, clay, sand, scoria, shale, caliche, and similar materials are removed, usually by scoop or shovel. This includes borrow pits, which are excavations to obtain fill dirt.

<u>Strip Mines</u> - excavations from which the overburden has been removed to extract the desired mineral, such as coal, leaving waste material piled in random heaps or, in some cases, deposited in fairly regular ridges and furrows.

1:24,000 and 1:25,000 scale
All open-pit mines, quarries,
pits, strip mines, and similar
surface excavations are mapped
and symbolized according to
type and size of the
excavation.

In addition to the symbol, a tint is used for all open-pit mines, quarries, and pits that are at least 0.50 inch in the shortest dimension.

A tint is used, without contours, to show active areal strip mines. Restored areal strip mines are contoured.

Both contours and tint are used to show linear strip mines.

Selection at 1:100,000 scale Show all open-pit mines, quarries, pits, and strip mines; symbolize and label according to type and size of the excavation. (Plate 112, symbol nos. 37 and 38)

Use a tint in addition to the symbol for all open-pit mines, quarries, and pits that are at least 0.24 inch in the shortest dimension.
(Plate 112, symbol nos. 37 and 38; plate 135, symbol nos. 2 and 4)

Use a tint without contours to show areal strip mines that are at least 0.24 in the shortest dimension.
(Plate 135, symbol no. 1)

Use both contours and a tint for linear strip mines. Symbolize to scale if the width exceeds the minimum symbol width of 0.036 inch. (Plate 135, symbol no. 1)



3.6.2.3 Underground Mines

Surface features related to underground mines include:

<u>Mine shaft</u> - an inclined or vertical opening, too steep for walking and more than 50 feet deep for obtaining gems, minerals, or mineral ores; hoisting and lowering personnel and materials; or ventilating underground workings.

Mine tunnel entrance - an opening to a horizontal mine tunnel or cave more than 50 feet long and level enough for walking to obtain gems, minerals, or mineral ores.

<u>Prospect</u> - an opening for mineral exploration shorter or shallower than a mine tunnel or shaft but at least 10 feet long or deep.

1:24,000 and 1:25,000 scale All entrances and other surface features related to underground mines are mapped.

In congested mining areas, it may be necessary to displace some structures to allow the shafts and tunnels to be placed in correct position.

If an area contains too many prospects to be mapped legibly, a representative pattern of prospects is mapped to show the extent of the prospected area.

Selection at 1:100,000 scale Show named mine tunnels and shafts only. Do not show prospects. (Plate 112, symbol nos. 35 and 36)



3.6.2.4 Tailings and Mine Dumps

<u>Tailings</u> - residue from ore treatment processes, such as washing, that is descarded and is not subject to further extraction processing.

Mine Dumps - piles of waste rock removed from a mine and discarded.

1:24,000 and 1:25,000 scale
All tailings and mine dumps
that are at least 0.50 inch in
the shortest dimension are
mapped.

Isolated mine dumps less than 0.50 inch are shown with hachures.

Selection at 1:100,000 scale Show tailings and mine dumps that are at least 0.12 inch in the shortest dimension. (Plate 135, symbol no.3)

3.6.2.5 Tailings Ponds

Tailings ponds are settling basins where fine particles of mill wastes suspended in water are pumped.

1:24,000 and 1:25,000 scale
All tailings ponds that are at least 0.12 inch in the shortest dimension are mapped.

Selection at 1:100,000 scale Show all tailings ponds that are at least 0.06 inch in the shortest dimension. (Plate 134, symbol no.2; and plate 132, symbol no.16)

3.6.3 <u>Wells (other than water)</u>, <u>Tanks</u>, <u>Reservoirs</u>, <u>Oil Sumps</u>, <u>and Sludge</u>
Pits

3.6.3.1 Wells (other than water)

A well is a hole drilled or bored into the earth to obtain petroleum, natural gas, brine, sulphur, and other minerals.

1:24,000 and 1:25,000 scale
All individual wells are
mapped where possible and
labeled to indicate type.
Water wells are treated in
section 3.7.7. Offshore oil
and gas wells are treated in
section 3.10, Bathymetry.

When wells are too numerous to be mapped in true position, the characteristic pattern of the wells is preserved by showing the wells on the perimeter and a representative number of wells in the group; the wells that are mapped

The minimum practical spacing between well centers is 0.10 inch.

should be mapped in correct

position.

In well-developed oil or gas fields, the main roads, principal buildings, and the more conspicuous tanks are mapped in their correct position.

In the remaining space, as many wells as possible are mapped in their correct position. Piping in the field is not mapped. Individual wells are not labeled but a label is shown for the field.

Selection at 1:100,000 scale In land areas, do not show individual wells. See section 3.7.7 for water wells. See section 3.10, Bathymetry, for offshore oil and gas wells.

Show all well-developed oil and gas fields by label only. (Plate 112, symbol no. 39)

3.6.3.2 Tanks and Reservoirs

A tank or open reservoir is a manmade receptacle used for the storage of gas, oil, water, or other liquids.

1:24,000 and 1:25,000 scale
All individual tanks are
mapped where possible. Only
water tanks are labeled as to
content. All tanks are shown
to scale if they exceed the
minimum symbol diameter of
0.03 inch. Covered water
reservoirs that are at least
0.030 inch in the shortest
dimension are mapped.

If tanks are too numerous to be mapped in true position, the characteristic pattern of the tanks is preserved by showing the tanks on the perimeter and a representative number of tanks in the group; tanks are mapped in correct position. The minimum symbol size may be reduced to 0.012 inch in congested areas.

Open reservoirs used for temporary storage of oil are mapped if they are large enough to plot to scale. Selection at 1:100,000 scale Show tanks that are at least 0.03 inch in diameter. Show tanks to scale if they exceed the minimum symbol size. (Plate 112, symbol no. 2)

Do not show open oil reservoirs.

3.6.3.3 Oil Sumps and Sludge Pits
Oil sumps or sludge pits are excavations or diked areas to hold water, mud, sludge, or other discharged material from an oil well.

1:24,000 and 1:25,000 scale
Oil sumps and sludge pits that
are associated with oil fields
and refineries, are mapped if
they can be plotted to scale
without displacing other
features.

Selection at 1:100,000 scale
Do not show oil sumps or
sludge pits.



3.6.4 Dams, Levees, and Locks

3.6.4.1 Dams and Weirs

These are permanent structures built to control, divert, or regulate the flow of water and include:

<u>Dams</u> - fixed barriers built across water features to confine the flow of water or to store water.

<u>Weirs</u> -fixed barriers over which water flows, serving to regulate water levels or measure flow.

<u>Diversion dams</u> - fixed dams for diverting stream water away from its course.

Check dams - barriers built to control erosion.

1:24,000 and 1:25,000 scale
All masonry dams and weirs are
mapped. The width is plotted
to scale if it is at least
0.02 inch. A highway or road
on a dam is shown using the
prescribed symbol.

Earth dams that are large enough to contour without exaggerating the feature are mapped.

Earth dams that impound water but are too small to be adequately shown by contours are indicated by plotting the reservoir shoreline parallel to the upstream face of the dam.

Check dams and diversion dams are shown with the levee symbol if they are at least 0.10 inch long but are too small to contour.

Selection at 1:100,000 scale Show all masonry dams and weirs that are at least 0.12 inch long. (Plate 112, symbol no. 63)

Show earth dams that are at least 0.12 inch long. (Plate 132, symbol no. 14)

Show earth dams less than 0.12 inch long by plotting the reservoir shoreline parallel to the upstream face of the dam.

Do not show check dams or diversion dams.

3.6.4.2 Levees and Dikes

Levees are embankments constructed of earth, stone, or other material to confine a stream channel and to prevent adjacent areas from flooding.

Dikes are embankments used to form a barrier to restrain water within an area that normally is flooded.

Embankments that serve other functions such as supporting a road, railroad, canal, or ditch above a flood plain, maintaining grade for canals or ditches, or earthen fire walls around storage tanks, are treated as levees or dikes.

1:24,000 and 1:25,000 scale
Levees and dikes that are at
least 0.04 inch wide at the
base are contoured. All
levees less than 0.04 inch
wide at the base are mapped
using the prescribed symbol.
Do not combine contours and
symbols in depicting the same
feature.

Selection at 1:100,000 scale Show all levees and dikes that are at least 0.24 inch long using the prescribed symbol. (Plate 132, symbol no. 13)

Masonry floodwalls are mapped with the wall symbol.

For levees and dikes carrying roads or railroads, the levee symbol is shown on both sides of the road or railroad if they can be plotted without displacing other features. If space does not permit showing both features, show only the road or railroad and label.

Show sea walls over 0.12 inch long. Do not show other walls.

Do not symbolize levees and dikes when they carry a road or railroad. Show the road or railroad only and label. (Plate 132, symbol no. 13)

3.6.4.3 Locks and Gates

Gates, which include head gates, check gates, sluice gates, are sliding barriers for regulating the passage of water, steam, or the like, in a dam, pipe, channel, etc.

A lock is an enclosure on a waterway used to raise or lower vessels as they pass from one level to another.

1:24,000 and 1:25,000 scale
All locks and gates are
mapped. If a lock is large
enough, the walls, gates and
other details are mapped to
scale.

Selection at 1:100,000 scale Show all gates and locks. Show locks to scale if they are large enough to show the walls, gates, and other details. (Plate 112, symbol no. 64)

3.6.5 Piers and Docks

Piers and docks include cultural features which project from the coastline into areas of open water. They may be constructed of masonry, concrete, rocks, or piling. Structures on pilings and on solid fill are treated the same.

Typical structures include:

<u>Pier</u> - a structure used to secure, protect, and provide access to ships.

<u>Wharf</u> - a landing place or pier built parallel to the shoreline where ships may tie up and load and unload passengers and cargo.

<u>Jetty</u> - a barrier built to influence the current or tide or to protect a harbor or shoreline from erosion.

<u>Breakwater</u> - a barrier built into the sea to protect a harbor or shore from the full impact of the waves.

Seawall - an embankment built to prevent erosion of a shoreline.

Causeway - a raised roadway built across water or marshland.



<u>Dock</u> - A slip or waterway between two piers or cut into the land that receives a ship for loading, unloading, or repairs. A dry dock provides support for a ship and a means for removing the water so that the bottom of the vessel can be exposed.

1:24,000 and 1:25,000 scale
All piers, wharves, dock,
jetties, breakwaters,
seawalls, and causeways that
are at least 0.05 inch long
are mapped. They are mapped
to scale if they are at least
0.02 inch wide.

Pier and wharf ruins that are at least 0.05 inch long are mapped.

Covered piers and wharves are mapped as buildings.

The natural shoreline is not broken for single-line piers, breakwaters, or short seawalls, and so on. The natural shoreline is omitted for extensive waterfronts, piers, wharves, or long seawalls, and so on. Selection at 1:100,000 scale Show all piers, wharves, docks, jetties, breakwaters, seawalls, and causeways that are at least 0.12 inch long. Show structures to scale if they are at least 0.02 inch wide.

(Plate 112, symbol no. 69)

Show pier and wharf ruins that are at least 0.12 inch long. (Plate 112, symbol no. 70)

3.6.6 Cemeteries

A cemetery is a place for burying the dead.

1:24,000 and 1:25,000 scale
All public and private
cemeteries are mapped. They
are shown to scale if they
exceed the minimum symbol
size.

A plot with more than two graves is mapped as a small cemetery. One or two graves are mapped with the cross symbol and no outline. Selection at 1:100,000 scale Show all national cemeteries. Show national cemeteries to scale if they exceed the minimum size of 0.04 inch. (Plate 112, symbol no. 72)

Show all other cemeteries that are at least 0.10 inch in the shortest dimension. (Plate 112, symbol no 73)

Do not show grave sites.

3.6.7 Airports

3.6.7.1 Airport

A tract of land where aircraft can take off and land, with facilities for refueling, extensive repairs, and shelters for passengers and cargo. The landing area may be on water.

1:24,000 and 1:25,000 scale
All airport facilities are
mapped. All paved runways,
taxiways, and aprons adjoining
hangars or terminals are
mapped to scale. Hangars,
terminals, and other buildings
are mapped as buildings.

Selection at 1:100,000 scale
Show all runways associated
with airports. Show to scale
if they exceed the minimum
symbol length and (or) width.
Do not show taxiways or
aprons.
Do not show hangars,
terminals, or other buildings.
(Plate 116, symbol no. 16)

3.6.7.2 Landing Field

An area where aircraft can take off and land, with limited or no facilities for refueling, repairs, or shelter for passengers and cargo, usually without hard-surfaced runways. In some cases, runways are not clearly defined.

1:24,000 and 1:25,000 scale
All landing fields are mapped.

Selection at 1:100,000 scale Show all landing fields. (Plate 116, symbol no. 16)

3.6.7.3 Landing Strip

A landing area with a single runway, improved or unimproved, with limited or no refueling facilities.

1:24,000 and 1:25,000 scale
All landing strips are mapped.

Selection at 1:100,000 scale Show all landing strips. (Plate 116, symbol no. 16)

3.6.7.4 Heliport

A landing area for helicopters.

1:24,000 and 1:25,000 scale All heliports are mapped, except when they are on buildings. Selection at 1:100,000 scale Show all heliports. (Plate 112, symbol no. 4; plate 116, symbol no. 15)

3.6.8 Boundaries

Civil boundaries are limiting lines of jurisdictional authority for the various levels of government.

3.6.8.1 National

These boundaries were established through treaties made by the nations concerned.

1:24,000 and 1:25,000 scale All national boundaries are mapped.

Selection at 1:100,000 scale Show all national boundaries. (Plate 112, symbol no. 74)

3.6.8.2 State, Territorial, Historical

The State boundaries have been defined by the Congress of the United States and may be changed only with the consent of the State concerned and the Congress of the United States. Territorial boundaries have been defined by treaty. Historical boundaries are boundaries that are important because of their historical or legal significance; in some cases parts of the historical boundary evolved into legally recognized modern boundaries.

1:24,000 and 1:25,000 scale All State and territorial boundaries are mapped.

Certain historical boundaries are mapped provided they are still relevant to modern boundaries or are used as a legal reference to an associated modern boundary. Examples include the Von Schmidt line (Nevada/ California) and the Baker line (between the Von Schmidt line and the present State boundary).

Selection at 1:100,000 scale Show all State and territorial boundaries. (Plate 112, symbol no. 75)

Show historical boundaries when they are in the source maps.

3.6.8.3 County, Parish, Alaska Borough, Municipio, and Judicial Division

These are subdivisions within a State and are usually fixed by
legislative action. Parishes are in Louisiana and municipios are in

Puerto Rico.

1:24,000 and 1:25,000 scale
All county, parish, Alaska
borough, municipio, and
judicial division boundaries
are mapped.

Selection at 1:100,000 scale Show all county, parish, Alaska borough, municipio, and judicial division boundaries. (Plate 112, symbol no. 76)

3.6.8.4 Civil Township, Town, District, Precinct, and Barrio
In the several states, the Virgin Islands, and Puerto Rico counties
or equivalent units are divided into minor civil subdivisions for
governmental administrative, educational, and other public purposes.

1:24,000 and 1:25,000 scale
All civil township, town,
district, precinct, and barrio
boundaries are mapped.

Selection at 1:100,000 scale Show all civil township, town, district, precinct, and barrio boundaries. (Plate 112, symbol no. 77)

3.6.8.5 Incorporated Cities, Towns, Villages, Boroughs, and Hamlets
Incorporated cities, towns, villages, boroughs, and hamlets may be
part of, independent of, or coextensive with the county, township or
other subdivision with which it is associated.

1:24,000 and 1:25,000 scale All incorporated city, town, village, borough, and hamlet boundaries are mapped. Selection at 1:100,000 scale Do not show these boundaries.

3.6.8.6 National or State Forest, Monument, Park, and Reservation; Hawaii Forest Reserve and Homestead

1:24,000 and 1:25,000 scale
All national or State forest,
monument, park, and
reservation and Hawaii Forest
Reserve and Homestead
boundaries are mapped.

Selection at 1:100,000 scale Show all national or State forest, monument, park, and reservation and Hawaii Forest Reserve and Homestead boundaries larger than the minimum size of 0.10 inch. (Plate 112, symbol no. 78)

3.6.8.7 County or City Park

1:24,000 and 1:25,000 scale All county or city parks are mapped.

Selection at 1:100,000 scale Show county or city parks larger than minimum size of 0.10 inch. (Plate 112, symbol no. 79)

3.6.8.8 Indefinite

If the accuracy of location is less than the position requirements for well-defined features (40 feet) the boundary is classed and shown as indefinite. The standard symbolization is used, but the line weight is reduced and the label "Indefinite Boundary" is used.

1:24,000 and 1:25,000 scale Indefinite boundaries are mapped and labeled. Selection at 1:100,000 scale Show and label indefinite boundaries. (Plate 112, symbol no. 80)

3.6.8.9 Boundary in Road

A boundary which coincides with the centerline of a road or highway.

1:24,000 and 1:25,000 scale Boundaries coincident with class 1 and 2 roads are mapped in their entirety. Selection at 1:100,000 scale Boundaries in roads are shown with a reduced line weight. (Plate 112, symbol nos. 74, 75, 76, 77, and 78)

3.6.9 Ruins and Sites

Ruins are structures of historical significance in such a state of decay that they can no longer be used for their original purpose. Show only if protected by Federal or State agencies.

3.6.9.1 Ruins and Archaeological sites

Show only if protected by Federal or State agencies.

1:24,000 and 1:25,000 scale Show only protected sites. Selection at 1:100,000 scale Minimum size 0.02 inch by 0.02 inch. If less than 0.10 inch by 0.10 inch use solid outlines. Show only protected sites. (Plate 112, symbol no. 33)

3.6.9.2 Cliff Dwelling Show only if protected by Federal or State agencies.

1:24,000 and 1:25,000 scale
All Federal or State protected
cliff dwellings are mapped.

Selection at 1:100,000 scale Show all protected dwellings. (Plate 112, symbol no.34)

3.6.10 Walls and Fences

3.6.10.1 Seawalls and Flood Control Walls

Walls that are built into or along a shoreline to protect against erosion or flooding.

1:24,000 and 1:25,000 scale Seawalls and flood control walls are mapped. Selection at 1:100,000 scale Show seawalls that are over 0.12 inch long. Do not show other walls.

3.6.10.2 Landmark Walls

Large walls separating property, usually found in Hawaii. Walls enclosing penitentiaries and correctional institutions.

1:24,000 and 1:25,000 scale Large landmark walls are mapped. Selection at 1:100,000 scale Show seawalls that are over 0.12 inch long. Do not show other walls.

3.6.10.3 Fence Lines

On 1:24,000-and 1:25,000-scale maps, selected fence lines are shown except where coincident with or closely paralleling roads, railroads, boundaries. Crop or field lines are not shown. A note in the margin of the map indicates fence lines are shown but not field checked.

1:24,000 and 1:25,000 scale Selected fence lines are mapped. Selection at 1:100,000 scale Do not show fence lines.



3.6.11 Public Land Survey System

All lands in the public domain are subject to subdivision by a rectangular system of surveys established and regulated by the Bureau of Land Management (BLM). Public lands are divided by north and south lines run according to the true meridian and by other lines crossing them at right angles into townships of 36 square miles.

3.6.11.1 Range and Township Lines

To begin the rectangular survey, an independent initial point was set. From this point a principal meridian is set north and south, and a baseline is set east and west. A township line runs east and west, parallel to a baseline at 6-mile intervals north and south of the baseline, and marks the relative locations of townships. A range line runs north and south, parallel to a principal meridian at 6-mile intervals east and west of the principal meridian, and marks the relative east and west location of rows of townships.

1:24,000 and 1:25,000 scale All surveyed range and township lines are mapped. Include privately surveyed lines accepted by BLM.

Protracted range and township lines are not shown.

Range and township lines of doubtful location are shown with a dashed line. Selection at 1:100,000 scale Show all BLM accepted range and township lines that are on the source maps. (Plate 123, symbol no. 1)

Show all protracted range and township lines with a dashed line.

(Plate 123, symbol no. 3)

3.6.11.2 Section Lines

A section line is a survey line bounding a 1- by 1-mile section within the public land survey system. Thirty-six sections are contained in one township.

1:24,000 and 1:25,000 scale All BLM accepted surveyed section lines are mapped.

Protracted section lines are not shown.

Section lines of doubtful location are shown with a dashed line.

Selection at 1:100,000 scale Show all section lines that are on the source maps. (Plate 123, symbol no. 2)

Show protracted section lines with a dashed line. (Plate 123, symbol no. 4)

3.6.12 Other Land Lines

3.6.12.1 Land-grant Lines

Land-grant lines were established by an Act of Congress or by a grant from the government controlling the land at the time of the grant.

1:24,000 and 1:25,000 scale Land-grant lines and donation claim lines are mapped where they have been accepted by the BLM. Selection at 1:100,000 scale
Show all land-grant lines and
donation claim lines.
When grant lines are too
congested to be shown in their
entirety, show exterior lines
and a representative pattern.
(Plate 123, symbol no. 5)

3.6.12.2 Old Indian Treaty and Reservation boundary lines
Old Indian treaty and reservation boundary lines were established by
treaty between Indian tribes and the U.S. Government.

1:24,000 and 1:25,000 scale Old Indian treaty lines and old Indian reservation boundaries are shown where they are reflected int he public land survey system.

Selection at 1:100,000 scale Show old Indian treaty lines that are on the source maps and not coincident with any streams, roads, or other boundaries. (Plate 123, symbol no. 6)

3.6.13 Offshore Protraction Survey Lines

Offshore protraction surveys are a series of rectangular grids (lease blocks) covering the Outer Continental Shelf (OCS) prepared by the Minerals Management Service (MMS) for managing Federal OCS leasing programs. The protraction surveys are plotted by MMS at 1:250,000 scale to produce the OCS Official Protraction Diagrams. The offshore protraction surveys are based on the Universal Transverse Mercator (UTM) projection except for an area off the coast of California (California State Plane Coordinate System, zone 6) and an area in the Gulf Of Mexico (either Texas State Plane Coordinate System, South or South Central zones or Louisiana State Plane Coordinate System, South zone).

1:24,000 and 1:25,000 scale Do not show Offshore Protraction Survey lines. Selection at 1:100,000 scale
Show Offshore Protraction
Survey lines on all coastal
topographic quadrangle maps
where the protraction survey
data are available.
Show number of each lease
block.
The diagram limit lines are
not labeled.
(Plate 125, symbols no. 1 and
2; plate 126, symbol no. 1)

3.6.14 Gaging station

Gaging stations measure the condition of hydrographic feature. Recording gaging stations are labeled "Gaging Station." Gages which do not have recording devices are not normally mapped. Some tidal gaging stations may no longer exist even though records relating to the station are available.

1:24,000 and 1:25,000 scale
Show all permanently housed
gaging stations. If the
elevation has been determined
by precise leveling, the bench
mark symbol is used instead
and the elevation is shown.

In the State of Florida show the approximate location and station number of tidal gaging stations that no longer exist. Label as "(site)" and show the station number. This information is supplied by Florida. Selection at 1:100,000 scale Show all permanently housed gaging stations. If the elevation has been determined by precise leveling, the bench mark symbol is used instead and the elevation is shown. (Plate 112, symbol no. 45)

Do not show tidal gaging stations that no longer exist.

3.7 HYDROGRAPHY

Hydrographic features are mapped to provide information for engineering, hydrologic, conservation, recreation, and environmental studies. Hydrographic features should be mapped as completely as the scale of the map allows and as accurately as other well-defined map features.

The amount of detail to be shown is determined by the importance of a hydrographic feature as related to other hydrographic, cultural, and hypsographic features shown on the map.

In predominantly wet or well-watered regions, intermittent tributary streams, intermittent ponds and springs, and features of small areal extent may be omitted, especially if they tend to impair the legibility of the more important features.

In arid and semiarid areas, the presence and location of water is important as a means of orientation. In these areas, as many hydrographic features as possible should be shown.

In small localized areas where hydrographic features are too numerous to show to scale, no attempt is made to show every feature. Instead a representative pattern of the symbols is shown that covers the localized area.



3.7.1 Classification

Natural and manmade hydrographic features are classified as perennial or intermittent as follows:

- o Perennial--containing water throughout the year (except for infrequent periods of severe drought).
- o Intermittent -- containing water only part of the year.

The perennial symbol must be consistent. Therefore, a feature not definitely known to be perennial should be classified as intermittent.

3.7.2 Shorelines

In tidal waters, the shoreline delineates the limits of land features at mean high water level (see Piers and Docks for manmade shorelines).

In nontidal water, the shoreline is the line of contact with the land that prevails for most of the year. This line is the <u>normal stage of water</u> and is often marked by a line of permanent land vegetation. The shorelines of lakes, ponds, and rivers are mapped to correspond to this normal stage of water as nearly as possible.

Shorelines for islands are delineated at the same hydrographic datum used for the shoreline of the adjacent mainland. Features that uncover at a stage of water lower than the datum used for the mainland shoreline are not shown as islands but as foreshore features.

3.7.2.1 Definite Shoreline

A definite shoreline is one whose position and shape have been accurately determined.

3.7.2.2 Indefinite Shoreline

An indefinite or unsurveyed shoreline is one whose position and shape are subject to change or have not been accurately determined.

3.7.2.3 Apparent Shoreline

An apparent shoreline is a coastal shoreline in areas of marsh grass, mangrove, or other similar marine vegetation. In these areas, the apparent shoreline is shown at the outer edge of vegetation, instead of the mean highwater line.

3.7.3 Lakes, Ponds, and Related Features

Natural lakes, ponds, and related features are categorized as perennial, intermittent, or dry.

Reservoirs with natural shorelines are artificial lakes formed by the water impounded by a dam; they are normally categorized as perennial features. The natural shoreline is omitted where it coincides with the dam (see Dams and Locks for criteria on selection of dams).

Sewage lagoons or ponds used for natural treatment of sewage by oxidation are mapped as perennial ponds. Industrial waste ponds (except mine tailing ponds and oil sumps) are also mapped as perennial ponds even though some treatment may be involved.

3.7.3.1 Perennial Lakes and Ponds

Perennial lakes and ponds contain water throughout the year except for infrequent periods of severe drought.

Shorelines for perennial lakes and ponds correspond to the normal stage of water and may be definite or indefinite. The shoreline of reservoirs corresponds to the normal stage of water as controlled by the dam.

Water surface elevations correspond to the normal stage of water. The water surface elevation for reservoirs is the normal operating level. If a reasonable value for the normal operating level cannot be established, the spillway elevation is used rather than the normal pool elevation.

1:24,000 and 1:25,000 scale
All perennial lakes and ponds
that are at least 0.024 inch
in the shortest dimension are
mapped.

Islands that are at least 0.024 inch are mapped.

In mapping reservoir areas, contours, double-line stream channels, and boundary and land lines are preserved from older, smaller scale maps. Other cultural information is deleted.

Selection at 1:100,000 scale Show all perennial lakes and ponds that are at least 0.06 inch in the shortest dimension. (Plate 141, symbol no.12; plate 145, symbol no.1)

Show islands that are at least 0.036 inch.

Preserve contours, boundaries, and land lines in reservoir areas. Delete other cultural information. Preserve all double-line stream channels. (Plate 141, symbol no. 34)

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3.7.3.2 Intermittent Lakes and Ponds

Intermittent lakes and ponds contain water only part of the year.

Shorelines for intermittent lakes and ponds correspond to the outer limits of the feature, which is the apparent highwater line. Shorelines for intermittent lakes and ponds are shown by using the line weight of other intermittent features.

A portion of a large intermittent lake that always contains water is delineated as a perennial feature. Similarly, an island within an intermittent lake is delineated.

Water surface elevations are not shown for intermittent lakes and ponds.

1:24,000 and 1:25,000 scale
All intermittent lakes and
ponds that are at least 0.024
inch in the shortest dimension
are mapped.

Selection at 1:100,000 scale Show all intermittent lakes and ponds that are at least 0.06 inch in the shortest dimension. (Plate 141, symbol no.13; plate 147, symbol no.1)

3.7.3.3 Dry Lakes and Ponds

Dry lakes and ponds are basins that formerly contained lakes but now seldom contain water or contain water for only short periods of time. Permanently drained lakes are not considered to be dry lakes.

Outlines for dry lakes and ponds correspond to the sediments of the former lake or pond. The surfaces are flat or nearly flat, support little or no vegetation, and do not necessarily occupy the entire area once covered by water. Shorelines for dry lakes and ponds are shown by using the line weight of other intermittent features.

Spot elevations are shown at the low points of large dry lakes.

1:24,000 and 1:25,000 scale
All dry lakes and ponds that
are at least 0.024 inch in the
shortest dimension are mapped.

Selection at 1:100,000 scale Show all dry lakes and ponds that are at least 0.12 inch in the shortest dimension. (Plate 141, symbol no. 14; plate 134, symbol no. 7)

3.7.3.4 Alkali Flats

An alkali flat is a level area or plain in an arid or semiarid region encrusted with alkali salts that became concentrated by evaporation and poor drainage.

1:24,000 and 1:25,000 scale All alkali flats are mapped.

Selection at 1:100,000 scale Show all alkali flats that are at least 0.24 inch in the shortest dimension. (Plate 141, symbol no. 16)

3.7.3.5 Land Subject to Inundation

Land subject to inundation is land that is flooded by the regulation of the level of water impounded by a dam.

1:24,000 and 1:25,000 scale
If the maximum area subject to inundation is at least 0.06 inch in the shortest dimension, it is outlined with an indefinite shoreline and fill is added in the area between the definite and indefinite shoreline. The permanent reservoir is mapped by using standard criteria.

Selection at 1:100,000 scale
Show land subject to
inundation if it is at least
0.24 inch in the shortest
dimension or 0.06 inch when
it parallels the shoreline.
Show the outer limits as
intermittent and fill the area
between the permanent pool and
the outer limits. Show the
permanent reservoir by using
standard criteria.
(Plate 141, symbol no. 38;
plate 146, symbol no. 1)

3.7.3.6 Area To Be Submerged

Area to be submerged is an area that will be flooded on completion of a dam under construction (see Dams and Locks for criteria on selection of dams under construction). The limits of the area to be submerged correspond to a contour at the elevation of the spillway or planned operating level of the reservoir.

1:24,000 and 1:25,000 scale
Areas to be submerged that are at least 0.06 inch in the shortest dimension are mapped.

Selection at 1:100,000 scale Show all areas to be submerged that are at least 0.06 inch in the shortest dimension. (Plate 141, symbol no. 39; plate 147, symbol no. 2)

All features in the area to be submerged are mapped as usual, including all culture, contours, drainage, and vegetation. Show all features in the areas to be submerged by using standard selection criteria, including all culture, contours, drainage, and vegetation.

3.7.3.7 Carolina Bays

Carolina bays are ovate, oval, or elliptical bays (bays in this sense are tracts of land, usually of prairie more or less surrounded by woods and containing a deep accumulation of humus, muck, or peat) that may be partly enclosed by low sandy ridges and that may enclose bodies of open water.

1:24,000 and 1:25,000 scale
All carolina bays are mapped.

Selection at 1:100,000 scale Show all carolina bays that are at least 0.12 inch in the shortest dimension. (Plate 141; symbol no. 7)

Carolina bays carry a special note in the credit legend - "Short dashed blue lines indicate elliptical bay outlines visible on aerial photographs."

Add explanatory note in credit legend.

3.7.4. Artificial Bodies of Water

3.7.4.1 Masonry Reservoirs

Masonry reservoirs may be built of either concrete or cinder blocks. They include features used for water storage and swimming pools (public and private).

1:24,000 and 1:25,000 scale All masonry reservoirs that are at least 0.025 by 0.05 inch are mapped. Selection at 1:100,000 scale Show all masonry reservoirs that are at least 0.06 inch in the shortest dimension. (Plate 112, symbol no. 6; plate 145, symbol no. 2)

3.7.4.2 Sewage Disposal Ponds and Water Filtration Ponds

Settling beds for sewage disposal plants and water filtration plants are ponds that are an integral part of the plant used for storing liquids after mechanical processing has been completed.

Sewage lagoons or ponds used for natural treatment of sewage by oxidation are mapped as perennial ponds. Industrial waste ponds (except mine tailing ponds and oil sumps) are also mapped as perennial ponds even though some treatment may be involved (see section 3.7.3.1).

1:24,000 and 1:25,000 scale
All sewage disposal ponds and
water filtration ponds that
are at least 0.02 by 0.02 inch
are mapped.

Selection at 1:100,000 scale Show all sewage disposal ponds and water filtration ponds that are at least 0.06 inch in the shortest dimension. (Plate 112, symbol no. 5; plate 147, symbol no. 3)

3.7.4.3 Fish Hatcheries and Fish Farms

Fish hatcheries are developed ponds where fish are raised for stocking lakes and ponds.

Fish farms are developed ponds where fish are grown for use as food, meal, and so on.

1:24,000 and 1:25,000 scale
All fish hatcheries and fish
farms that are at least 0.024
inch in the shortest dimension
are mapped.

Selection at 1:100,000 scale Show all fish hatcheries and fish farms that are at least 0.06 inch in the shortest dimension. (Plate 112, symbol no. 6; plate 145, symbol no. 2)

3.7.4.4 Duck Ponds

Duck ponds are commercially developed ponds used for duck hunting, normally found along the Pacific coast flyway.

1:24,000 and 1:25,000 scale All duck ponds are mapped.

Selection at 1:100,000 scale Show all duck ponds that are at least 0.12 inch in the shortest dimension. (Plate 141, symbol no. 17; plate 146, symbol no. 2)

3.7.4.5 Salt or Soda Evaporators

Salt evaporators are ponds, usually segmented, used for the commercial production of salt by evaporation of brine.

1:24,000 and 1:25,000 scale All salt evaporators are mapped.

Selection at 1:100,000 scale Show all salt evaporators that are at least 0.12 inch in the shortest dimension. (Plate 141, symbol no. 15)

3.7.4.6 Cranberry Bogs

Cranberry bogs are periodically flooded areas in which cranberries are cultivated.

1:24,000 and 1:25,000 scale
All cranberry bogs are mapped.

Selection at 1:100,000 scale Show all cranberry bogs that are at least 0.12 inch in the shortest dimension. (Plate 141, symbol no. 36)

3.7.4.7 Rice Fields

Rice fields are areas subjected to controlled flooding in which rice is grown.

1:24,000 and 1:25,000 scale All rice fields are mapped.

Selection at 1:100,000 scale
Do not show rice fields.

3.7.5 Streams and Related Features

The term streams includes rivers, creeks, brooks, runs, and so on. Streams are delineated in an amount sufficient to reflect the existing type of drainage pattern and relative texture to provide immediate recognition of landforms and direction of slope.

Streams are symbolized according to their width and classification.

3.7.5.1 Perennial Streams

Perennial streams contain water throughout the year except for infrequent periods of severe drought. Stream width is determined at the normal stage of water.

1:24,000 and 1:25,000 scale
All perennial streams that can
be plotted accurately are
mapped.

If a perennial stream cannot be plotted accurately, it is mapped as unsurveyed.

Perennial streams are mapped to scale if they are at least 0.025 inch wide. Selection at 1:100,000 scale Show all perennial streams that are at least 0.63 inch long. (Plate 141, symbol no. 4)

Show perennial streams that cannot be accurately located as unsurveyed.
(Plate 141, symbol no. 5)

Show all perennial streams to scale if they are at least 0.024 inch wide.

3.7.5.2 Intermittent Streams

Intermittent streams contain water for only part of the year. Stream width is determined by the banks of the feature at flood stage.

Dry washes, arroyos, dry gulches, and ephemeral drains are classified as intermittent. They are normally dry, containing water only during or for a few hours after a local rainstorm or heavy snowmelt. The channels may divide and subdivide, start and disappear, because they usually occur in porous ground and are formed by a sudden runoff.

1:24,000 and 1:25,000 scale
Small tributary intermittent
streams are mapped to the
extent necessary to reflect
the distinguishing
characteristics of the
existing drainage pattern.
Short intermittent streams
that are clearly evident from
the contour portrayal may be
omitted.

Selection at 1:100,000 scale Show all intermittent streams that are at least 0.63 inch long. (Plate 141, symbol no.6)

In areas of limited relief, intermittent streams are delineated to their sources to point up the drainage divides.

In arid and undeveloped areas, as many intermittent streams are mapped as the map scale allows.

If an intermittent stream cannot be accurately mapped, it is mapped as unsurveyed.

Intermittent streams are mapped to scale if they are at least 0.025 inch wide.

Do not show unsurveyed intermittent streams.

Show all intermittent streams to scale if they are at least 0.024 inch wide.

Dry washes that are at least 0.04 inch are mapped by using a sand pattern. Permanent channels within the wash areas are mapped as perennial or intermittent, as appropriate

Show dry washes that are at least 0.06 inch wide by using a sand pattern.
(Plate 134, symbol no. 1)

3.7.5.3 Braided Streams

Braided streams are stream courses not filled by normal flow that subdivide into interlacing channels. Braided streams may be either perennial or intermittent.

1:24,000 and 1:25,000 scale
All braided streams are mapped
and symbolized according to
classification.

Selection at 1:100,000 scale Show all main channels and a pattern of the secondary channels to reflect the limits and braided characteristics of the stream. Symbolize according to classification.

3.7.5.4 Disappearing Streams

A disappearing stream is a watercourse that flows into a sinkhole and continues its course in a subterranean channel. Streams entering culverts, pipes, or other structures are not treated as disappearing streams.

1:24,000 and 1:25,000 scale All perennial disappearing streams are mapped.

Only the above ground portion and the point where the stream disappears are mapped. The underground channel is not mapped. Selection at 1:100,000 scale Show all perennial streams that disappear at a definite point if they are at least 0.63 inch long. (Plate 141, symbol no. 8)

Show only the above ground portion and the point where the stream disappears. Do not show the underground channel.

3.7.5.5 Rapids and Waterfalls

Rapids are formed where the current of a river accelerates because of an increase in the gradient and because the surface is broken by obstructions such as rocks and boulders.

Waterfalls are created by a vertical or near vertical descent of a stream.

1:24,000 and 1:25,000 scale
All rapids are mapped. On
double-line rivers, the
beginning and the end of the
feature are indicated.

All waterfalls are mapped. On double-line rivers, the shape of the feature is indicated.

Selection at 1:100,000 scale Show all rapids. Indicate the beginning and the end of the feature on all double-line rivers. (Plate 141, symbol nos. 31 and 32)

Show all waterfalls. Indicate the shape of the feature on double-line rivers. (Plate 141, symbol nos. 29 and 30)

3.7.5.6 Boat Trails

Boat trails are areas where the vegetation has been compressed by airboats traveling through swamps and marsh lands, such as the Everglades.

1:24,000 and 1:25,000 scale All main, connecting trails that are visible on aerial photographs are mapped. Selection at 1:100,000 scale Show all boat trails that are at least 0.63 inch long.

3.7.6 Canals, Ditches, Aqueducts, and Related Features

3.7.6.1 Canals and Ditches

A canal or ditch is a manmade waterway or artificially improved river used for irrigation, drainage, shipping, or travel.

1:24,000 and 1:25,000 scale
All canals and ditches are
mapped and symbolized
according to classification.

Selection at 1:100,000 scale
Show all canals and main
ditches that are at least 0.63
inch long. Show enough of the
minor feeder ditches to
represent the basic network of
the drainage or irrigation
system. Symbolize canals
according to classification.
Symbolize main ditches as
perennial features and all
other ditches as intermittent
features.
(Plate 141, symbol no. 19)

All abandoned canals are mapped.

(Plate 141, symbol no. 20)

Canals and ditches are mapped to scale if they are at least 0.025 inch wide.

Show all canals and ditches to scale if they are at least 0.024 inch wide.

Show all abandoned canals that

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3.7.6.2 Aqueducts, Water Pipelines, Flumes, Penstocks, and Siphons

Aqueduct - an open or covered conduit used for carrying large quantities of water. It may be constructed of brick, stone, or concrete or tunnelled through rock and may occur on, above, or below the ground surface.

<u>Water pipeline</u> - a closed pressure conduit used for carrying smaller quantities of water than an aqueduct. It is composed of sections of pipe that may be on, above, or below the ground surface.

<u>Flume</u> - an open and inclined channel, usually V-shaped, that carries water at a constant gradient. It is used in mining, irrigation, or logging operations. Generally the major portion is elevated on a trestle over drops in ground level because a nearly constant gradient is required to maintain a uniform flow.

<u>Penstock</u> - a closed pipe or channel used to convey water into the turbine of a hydroelectric generating plant. It may be composed of any type of pipe, including timber, and may occur on, above, or below the ground surface. Penstocks usually occur in groups paralleling each other because a separate penstock is required for each turbine.

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> Siphon - a pipe conveying water to a lower level over an obstacle higher than the intake.

1:24,000 and 1:25,000 scale All aqueducts, flumes, and penstocks are mapped and symbolized according to classification and location relative to the ground surface. Landmark water pipelines are mapped and symbolized as intermittent aqueducts.

Selection at 1:100,000 scale Show all aqueducts, flumes, and penstocks that are at least 0.63 inch long symbolized according to classification and location relative to the ground surface. For underground features, show the main lines only. (Plate 141, symbol nos. 19, 21, and 22)

Abandoned aqueducts and flumes -are-mappedShow abandoned aqueducts and flumes if they are at least 0.63 inch long. (Plate 141, symbol no. 20)

1:24,000 and 1:25,000 scale Aqueducts, flumes and penstocks are mapped to scale if their width is at least 0.024 inch.

Aqueduct tunnels are mapped if they can be positioned properly.

All siphons are mapped.

Selection at 1:100,000 scale Show all aqueducts, flumes, and penstocks to scale if their width is at least 0.024 inch.

Show aqueduct tunnels if they can be positioned properly. (Plate 141, symbol no. 23)

Show all siphons. (Plate 141, symbol no. 21)

3.7.7 Wells and Springs

3.7.7.1 Water Wells

A water well is a pit or hole that is sunk by digging or drilling below ground level to reach a supply of water.

An artesian well is a well in which the water level rises above the top of the water-bearing bed because of internal hydrostatic pressure. Artesian wells are treated as other wells, except that a characteristic label is added if the water actually flows at the surface.

1:24,000 and 1:25,000 scale
In arid and semiarid regions,
all water wells are mapped,
except those within 0.25 inch
of a farm building.

In well-watered areas, only wells that are an important part of the water resources of an area are mapped. Selection at 1:100,000 scale Show all water wells in arid and semiarid regions. (Plate 141, symbol no. 26)

In well-watered areas, show only those wells that are an important part of the water resources of a region.

3.7.7.2 Geysers

A geyser is a spring that throws forth intermittent jets of heated water and steam.

1:24,000 and 1:25,000 scale All geysers are mapped.

Selection at 1:100,000 scale Show all geysers. (Plate 141, symbol no. 26)

3.7.7.3 Springs and Seeps

A spring is a natural outflow of water from a subsurface level onto the land or into a body of surface water.

A seep is a small spring.

1:24,000 and 1:25,000 scale In arid and semiarid regions, all springs are mapped.

In well-watered areas, small springs may be omitted, but large and well-known springs are mapped.

Selection at 1:100,000 scale Show all springs in arid and semiarid regions. (Plate 141, symbol no. 25)

In well-watered areas, show all large and well-known springs.

3.7.8 Marshes and Swamps

Marshes and swamps (in this definition, marsh and swamp are synonymous) are lands that are normally so saturated with water that they are not suitable for cultivation without first being drained. Cross-country movement through the area is difficult or impossible except during periods of drought or when frozen.

Usually the area is covered with characteristic grass and reed growths; however the absence of this vegetation does not necessarily preclude classifying an area as marsh or swamp.

Except for mangrove, no special treatment is required for wooded marshes or swamps. The swamp and vegetation are mapped separately in accordance with instructions for each.

The degree of wetness varies with the feature and with particular features during the year. If a marsh or swamp is normally submerged, as at the head of a lake, the swamp and open water are mapped separately in accordance with the instructions for each. Submerged wooded swamps are mapped separately, in accordance with the instructions for swamp, woodland, and open water.

Coastal marshes occurring in tidal waters cover and uncover with the tide. They are treated as ordinary marshes or swamps, except that the shorelines are delineated as the limits of the open water side of the feature and not the mean highwater line.

Land subject to inundation is not regarded as marsh or swamp land.

1:24,000 and 1:25,000 scale All marshes and swamps are mapped.

Selection at 1:100,000 scale Show all marshes and swamps that are at least 0.24 inch in the shortest dimension. (Plate 143, symbol no. 1)

3.7.9 Glaciers and Permanent Snowfields

Permanent snowfields occur in areas where warm weather melting and evaporation fail to remove winter snowfalls, which results in successive ice packing and perpetual snow coverage.

A glacier is a mass of ice with definite lateral limits and motion in a definite direction and originating from the compacting of snow by pressure.

1:24,000 and 1:25,000 scale All glaciers and permanent snowfields that are at least 0.12 inch in the shortest dimension are mapped.

Contours are continued across the snow or ice. When source materials are inadequate to permit portrayal by normal contouring techniques, approximate contours or form lines are used to show the surface forms.

Any original land or rock surface that projects through the glacier (nunatak) is contoured in the same manner as any other land form. Selection at 1:100,000 scale Show all glaciers and permanent snowfields that are at least 0.12 inch in the shortest dimension. (Plate 141, symbol nos. 27 and 28)

Continue contours across the snow or ice. Use approximate contours or form lines to show surface forms if source materials are inadequate for contours.

Show any original land or rock surface that projects through the glacier (nunatak) by contouring in the same manner as any other land form.



3.7.10 Coastal Hydrography

This section describes coastal hydrographic features that are shown on topographic editions. These features are extracted from the latest available nautical charts published by the National Ocean Service and may be supplemented by aerial photographs.

For descriptions of features shown on topographic-bathymetric editions, see section 3.10, Bathymetry. Bathymetric information, including the shoreline, is prepared by the National Ocean Service.

Coastal hydrographic features include permanent cultural and natural features in tidal waters as well as inland waters that are navigable from the coast. Tidal waters are natural bodies of water that are subject to periodic rising and falling or flowing and ebbing.

The sounding datum line is used as the plane of reference for soundings to determine the position of the low water line when used on charts and maps and to fix those coastal boundaries that are formed by, based on, or measured from the low water line. It corresponds to mean lower low water, which is the average of the lowest low water height of each tidal day observed over the National Tidal Datum Epoch.

The datum for the Great Lakes is low lake levels defined as elevations referred to the International Great Lakes Datum.

Foreshore areas are bare or awash at the sounding datum line but covered at mean high water.

Offshore areas are always covered at the sounding datum line.

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3.7.10.1 Foreshore Flats

Foreshore flats occur in the foreshore areas of tidal waters only and may be either contiguous to or detached from the shore.

Generally, foreshore flats are devoid of vegetation and may be composed of the following substances:

Sand

Sand and mud

Gravel

Mud

Sand and gravel

Clay

In some cases, the flat may contain low or sparse seagrass growths; these are treated as foreshore flats and not as coastal marshes.

1:24,000 and 1:25,000 scale All foreshore flats are mapped.

Selection at 1:100,000 scale Show foreshore flats only on topographic-bathymetric editions. See section 3.10, Bathymetry,

See section 3.10, Bathymetry, for selection criteria.

3.7.10.2 Reefs and Rocky Ledges

A reef is a rock or coral formation that is detached from the shore. A ledge is a rocky formation connected with and fringing the shore.

1:24,000 and 1:25,000 scale All rock and coral reefs and ledges are mapped. Selection at 1:100,000 scale Show rock and coral reefs only on topographic-bathymetric editions.

See section 3.10, Bathymetry, for selection criteria.

3.7.10.3 Rocks (Bare or Awash)

Bare rocks are exposed at mean high water. Rocks awash are exposed at any stage of tide between mean high water and the sounding datum line.

1:24,000 and 1:25,000 scale All rocks, bare or awash, are mapped.

Selection at 1:100,000 scale
Show rocks, bare and awash,
only on topographicbathymetric editions.
See section 3.10, Bathymetry,
for selection criteria.

3.7.10.4 Wrecks

An exposed wreck is one that has any portion of the hull or superstructure above the sounding datum line.

A sunken wreck with masts exposed is one whose hull and superstructure are below the sounding datum line and whose masts are exposed.

Exposed wreckage is an area containing more than one wreck.

1:24,000 and 1:25,000 scale
All exposed wrecks are mapped.

Selection at 1:100,000 scale
Show exposed wrecks only on topographic-bathymetric editions.
See section 3.10, Bathymetry, for selection criteria.

3.7.10.5 Offshore Oil and Gas Wells and Platforms

1:24,000 and 1:25,000 scale
All offshore oil and gas wells
and platforms are mapped. In
addition, more recent aerial
photographs are obtained and
new oil and gas platforms are
added.

Selection at 1:100,000 scale Show oil and gas wells and platforms only on topographicbathymetric editions. See section 3.10, Bathymetry, for selection criteria.

3.7.10.6 Offshore Pipelines

1:24,000 and 1:25,000 scale Submerged pipelines and sewer lines are mapped when information is available. Selection at 1:100,000 scale Show submerged pipelines and sewer lines only on topographic-bathymetric editions. See section 3.10, Bathymetry, for seleciton criteria.

3.7.10.7 Depth Curves

A depth curve is a line connecting points of equal depth below the sounding datum line.

1:24,000 and 1:25,000 scale
All depth curves are shown for
6-, 12-, 18-, 24-, 30-, 60-,
120-, 300-, and 600-foot
depths.

Selection at 1:100,000 scale
Do not show depth curves.
Show bathymetric contours on topographic-bathymetric editions only.
See section 3.10, Bathymetry, for selection criteria.

3.8 HYPSOGRAPHY

The height and shape of the land surface collectively referred to as relief features are represented on topographic maps for two purposes. The first and most important is to present an accurate, measurable geometric description of the terrain; the second, to give an overall visual impression of the character of the landscape. Relief symbols, such as contours, and their treatment on topographic maps are designed to attain these objectives.

Contour lines are used to portray relief because they present both quantitative elevation information and a terrain picture. Other means are hachures, form lines, pattern symbols used in various combinations, and spot elevations.

3.8.1 Contours

A contour is a line connecting points of equal elevation on the ground, all points of which are of equal elevation as referred to a specified common datum. Currently the National Geodetic Vertical Datum of 1929 is used for USGS topographic maps.

3.8.1.1 Index Contours

Index contours (every fourth or fifth line, depending on the contour interval) are accentuated by increasing their width, and many of them are labeled with the elevations they represent. Index contours serve as a visual reference framework to define the basic structure of the relief features.

1:24,000 and 1:25,000 scale
All index contours are mapped where scale permits. In areas with vertical or near-vertical relief some index contours may be shown with the carrying contour symbol (see section 3.8.1.5).

Selection at 1:100,000 scale Show all index contours except in areas of vertical or nearvertical relief. Some index contours may be shown as carrying contours. (Plate 132, symbol no. 1)

3.8.1.2 Intermediate Contours

Intermediate contours are the three or four lines at the determined contour interval between adjacent index contours.

1:24,000 and 1:25,000 scale
All intermediate contours are
mapped where scale permits. In
areas with vertical or nearvertical relief some
intermediate contours may be
shown with the carrying
contour symbol. (see section
3.8.1.5)

Selection at 1:100,000 scale
Show all intermediate contours
where scale permits. In areas
of vertical or near-vertical
relief some intermediate
contours may be shown with the
carrying contour symbol.(see
section 3.8.1.5)
(Plate 132, symbol no. 2)

3.8.1.3 Supplementary Contours

Supplementary contours are drawn at one-half, one-fourth, or one-fifth the basic contour interval and are screened lines. It is not necessary for supplementary contours to be continuous. They may be shown in sections of any length whenever their presence adds to the readability of the topography.

1:24,000 and 1:25,000 scale
All supplementary contours are mapped where necessary to depict significant relief features that cannot be shown by the normal contour interval. They are usually shown in coastal areas, dry lakes, or areas that include landforms of high local relief.

Selection at 1:100,000 scale
Show all supplementary
contours where necessary to
depict significant relief
features that cannot be shown
by the normal contour
interval. They are usually
shown in coastal areas, dry
lakes, or areas that include
landforms of high local
relief.
(Plate 133, symbol no. 1)

3.8.1.4 Depression Contours

Depression contours are used to depict closed areas surrounded by higher land, such as a basin or sink. They can be either index, intermediate, or both.

Depressions are shown by contours with ticks pointing down slope and inward. Large regional depressions sometimes carry a label "depression" and ticks are shown on the top and bottom depression contours only.

1:24,000 and 1:25,000 scale
All depression contours are
mapped that are at least 0.025
inch in the shortest
dimension.

Selection at 1:100,000 scale Show all depression contours that are at least 0.025 inch in the shortest dimension. (Plate 132, symbol no. 6)

3.8.1.5 Carrying Contours

Carrying contours are single lines representing two or more contour lines used to show vertical or near-vertical topographic features, such as cliffs, cuts, and fills, where map scale precludes showing individual contour lines.

1:24,000 and 1:25,000 scale
All carrying contours are
mapped at cliffs, embankments,
rims, and bluffs where
contours merge.

Selection at 1:100,000 scale Show all carrying contours at cliffs, embankments, rims and bluffs where contours merge. (Plate 132, symbol no. 5)

3.8.1.6 Feathering-out Treatment

Feathering-out treatment of contours is when the intermediate contours are dropped and the index contours are drawn through in areas of vertical or near-vertical topographic features. Do not feather contours on manmade features, cuts, fills, overpasses, and interchanges.

1:24,000 and 1:25,000 scale All feathering contours are mapped at cliffs where contours merge. Selection at 1:100,000 scale Show all feathering contours at cliffs where contours merge. (Plate 132, symbol no. 4)

3.8.1.7 Approximate Contours

Approximate contours are used only in areas where compilation of contours to desired accuracy standards is not feasible. They are screened lines and should be explained by a marginal note.

1:24,000 and 1:25,000 scale All approximate contours are mapped where necessary. Selection at 1:100,000 scale Show all approximate contours where necessary. (Plate 132, symbol no. 3)

3.8.1.8 Supplementary Depression Contours

Supplementary depression contours are drawn at one-half, one-fourth, or one-fifth the basic contour interval. They are screened lines used to depict closed areas surrounded by higher land, such as a basin or sink.

They may be shown in sections of any length, whenever their presence adds to the readability of the topography.

1:24,000 and 1:25,000 scale
All supplementary depression
contours are mapped where
necessary to depict
significant relief features
that can not be shown by the
normal contour interval.

Selection at 1:100,000 scale Show all supplementary depression contours where necessary to depict significant relief features that can not be shown by the normal contour interval. (Plate 133, symbol no. 2)

3.8.2 <u>Hachures</u>

Hachures are lines drawn in the direction of the ground slope to show small mine dumps that are prominent but not high enough to be shown by the selected contour interval or that are too small to contour.

1:24,000 and 1:25,000 scale
All small mine dumps too small
to contour or not high enough
to be shown by the selected
contour interval that are at
least 0.025 inch in the
shortest dimension are mapped
with hachures.

Selection at 1:100,000 scale Do not show hachures.

3.8.3 Intricate Surface Areas

Intricate surface areas that are complex, irregular, or subject to frequent contour change are shown by a variety of surface patterns.

Surface patterns are a standard design of dots or tints that represent the general character of the ground surface of special areas. Labels identify the kinds of patterns or tints used.

3.8.3.1 Sand and Mud Areas

Sand is loose granular, gritty particles of worn or disintegrated rock, finer than gravel and coarser than dust.

Mud is wet, sticky, soft earth.

1:24,000 and 1:25,000 scale
All sand and mud areas are
mapped that are at least 0.24
inch in the shortest
dimension.

Selection at 1:100,000 scale Show all sand and mud areas that are at least 0.24 inch in the shortest dimension. (Plate 134, symbol no. 3)

3.8.3.2 Shifting Sand and Dune Areas

Shifting sand and dunes are sand areas, hills, or ridges of sand that are formed by prevailing winds and the shifting winds.

1:24,000 and 1:25,000 scale
All shifting sand or dune
areas are mapped that are at
least 0.24 inch in the
shortest dimension.

Selection at 1:100,000 scale Show all shifting sand or dune areas that are at least 0.24 inch in the shortest dimension. (Plate 134, symbol no. 6; label on plate no. 114)

3.8.3.3 Gravel Beach

Gravel is an unconsolidated mixture of rock fragments or pebbles.

1:24,000 and 1:25,000 scale
All gravel beaches are mapped
that are at least 0.12 inch in
the shortest dimension.

Selection at 1:100,000 scale Show all gravel beaches that are at least 0.12 inch in the shortest dimension.

Show all sand beaches that are at least 0.12 inch in the shortest dimension.

Label sand or gravel
(Plate 134, symbol no.5)

3.8.3.4 Wide Wash

Wide wash is a dry bed of a stream that fills with water very briefly during periods of heavy rain.

1:24,000 and 1:25,000 scale All wide washes are mapped that are at least 0.04 inch wide.

Selection at 1:100,000 scale Show all wide washes that are at least 0.06 inch wide. Minimum length 0.63 inch. (Plate 134, symbol no. 1)

3.8.3.5 Sand in Open Water

Sand in open water other than tidal waters.

1:24,000 and 1:25,000 scale
All sand in open water is
mapped that is at least 0.63
inch in the shortest
dimension.

Selection at 1:100,000 scale Do not show sand in open water.

3.8.3.6 Lava

The rock formed by the cooling and solidifying of molten lava.

1:24,000 and 1:25,000 scale
All lava is mapped that is at least 0.24 inch in the shortest dimension.

Selection at 1:100,000 scale Show all lava that is at least 0.24 inch in the shortest dimension. (Plate 135, symbol no. 5)

3.8.3.7 Glacial Moraine

Glacial moraine is an accumulation of earth and stone debris carried and deposited by a glacier.

1:24,000 and 1:25,000 scale
All glacial moraine is mapped that is at least 0.063 inch wide.

Selection at 1:100,000 scale Show all glacial moraine that is at least 0.12 inch in the shortest dimension. (Plate 134, symbol no. 4)

3.8.4 Divide

A ridge or line dividing two different watersheds.

1:24,000 and 1:25,000 scale The Continental and Tennessee Valley Divides are the only divides mapped.

Selection at 1:100,000 scale Show only Continental and Tennessee Valley Divides. (Plate 132, symbol no. 15)

3.8.5 Spot Elevations

Spot elevations at identifiable map locations or features provide more accurate elevations than can be interpolated from contours and present additional hypsographic information in flat areas where contours are widely spaced.

1:24,000 and 1:25,000 scale Used when there is no obvious identifiable feature.

Selection at 1:100,000 scale
Show spot elevations if available as needed to improve
interpretation of terrain.
Space no closer than approximately 2.0 to 3.0 inches
apart. Show elevation to
nearest meter when primary
contour interval is 5 meters
or larger; to nearest 0.5
meter when primary contour
interval is less than 5
meters.

3.9 VEGETATION

Vegetation refers to the various types of plant life indigenous to the area. Military personnel consider vegetation to be important as cover for troops or as a possible impediment to troop movement. Information on the types and distribution of vegetation is useful to managers of forests, rangelands, and wildlife; to scientists concerned with water resources, soil conservation, and land utilization; to engineers planning highways, electrical transmission lines, and recreational facilities; and to individuals interested in hunting, hiking, and camping.

The amount and type of vegetation to be shown are directly related to the permanency of the vegetation and the scale of the map. Generally a distinction is made between natural vegetation and orchards and vineyards.

Many of the intricate vegetation patterns existing in nature cannot be depicted exactly by line drawings. It is therefore necessary in some places to omit less important scattered growth and to generalize complex outlines.

3.9.1 Wood or Brushwood

Wood or brushwood areas contain growth of perennial vegetation of at least 50 percent crown cover and at least 6 feet in height that afford effective concealment for troops and may present obstacles to free passage.

1:24,000 and 1:25,000 scale
All wood or brushwood areas
are mapped that are at least
0.10 inch in the shortest
dimension. All clearings are
mapped that are at least 0.10
inch in the shortest
dimension.

Selection at 1:100,000 scale Show all wood and brushwood areas that are at least 0.10 inch in the shortest dimension. Show all clearings that are at least 0.10 inch in the shortest dimension. (Plate 152, symbol no. 1)

3.9.2 Scrub

Scrub areas are covered with low growing or stunted perennial vegetation such as cactus, mesquite, or sagebrush. Scrub is common in arid areas and usually is not mixed with trees.

1:24,000 and 1:25,000 scale
All scrub areas are mapped
that are at least 0.10 inch in
the shortest dimension. All
clearings are mapped that are
at least 0.10 inch in the
shortest dimension.

Selection at 1:100,000 scale
Show all scrub areas that are
at least 0.10 inch in the
shortest dimension. Show all
clearings that are at least
0.10 inch in the shortest
dimension.
(Plate 154, symbol no. 1)

3.9.3 Orchard

Orchards are plantings of evenly spaced trees or tall bushes that bear fruits or nuts. Plantings of citrus and nut trees commonly called groves are included in this category.

1:24,000 and 1:25,000 scale
All orchards are mapped that
are at least 0.10 inch in the
shortest dimension. All
clearings are mapped that are
at least 0.10 inch in the
shortest dimension.

Selection at 1:100,000 scale Show all orchards that are at least 0.10 inch in the shortest dimension. Show all clearings that are at least 0.10 inch the shortest dimension. (Plate 155, symbol no. 1)

3.9.4 Vineyard

Vineyards are plantings of grapevines or other kinds of cultivated climbing plants, such as berry vines and hops, supported on permanent structures and arranged evenly in rows.

1:24,000 and 1:25,000 scale
All vineyards are mapped that
are at least 0.10 inch in the
shortest dimension. All
clearings are mapped that are
at least 0.10 inch in the
shortest dimension.

Selection at 1:100,000 scale
Show all vineyards that are at
least 0.10 inch in the
shortest dimension. Show all
clearings that are at least
0.10 inch in the shortest
dimension.
(Plate 156, symbol no. 1)

3.9.5 Scattered Trees

Scattered trees are a growth of perennial vegetation of 25- to 50-percent crown cover and at least 10 feet in height that affords partial concealment for troops and may present obstacles to free passage.

1:24,000 and 1:25,000 scale
All scattered trees are mapped
that are at least 0.10 inch in
the shortest dimension. All
clearings are mapped that are
at least 0.10 inch in the
shortest dimension.

Selection at 1:100,000 scale Do not show scattered trees.

3.9.6 Mangrove

Mangrove is a thick growth of trees with tangled aerial roots that appears in tropical and semitropical regions. It occurs in low-lying areas along seacoasts and along the banks of tidal waters up to the limits of the tidal influence.

1:24,000 and 1:25,000 scale
All mangrove is mapped that is at least 0.10 inch in the shortest dimension.

Selection at 1:100,000 scale Show all mangrove that is at least 0.10 inch in the shortest dimension. (Plate 152, symbol no. 4)

3.10 BATHYMETRY

The science of measuring water depths (usually in the ocean) to determine bottom topography.

The bathymetry shown on USGS quadrangles is produced from material compiled by the National Ocean Service (NOS). The 1:100,000-scale quadrangle bathymetry is taken directly from NOS compilation, not from the 1:24,000-and 1:25,000-scale source.

The mean high water line (shoreline) and sounding datum line for tidal water areas are produced from material compiled by the NOS from tide coordinated aerial photographs. The apparent shoreline for tidal waters is produced from USGS 1:24,000- and 1:25,000-scale quadrangle maps for areas not shown on the NOS compilation overlay.

3.10.1 Shoreline

In tidal waters the shoreline delineates the limits of land features at mean high water level.

3.10.1.1 Mean High Water Line (Shoreline)

The mean high water line (shoreline) is compiled by NOS from tide coordinated aerial photographs.

1:24,000 and 1:25,000 scale
All mean high water lines
(shorelines) shown on the NOS
compilation overlay are
mapped.

Selection at 1:100,000 scale Show all mean high water lines (shorelines) that are on the NOS compilation overlay. (Plate 141, symbol no. 1)

3.10.1.2 Apparent Shoreline

The apparent shoreline is taken from USGS 1:24,000- and 1:25,000-scale quadrangle maps.

1:24,000 and 1:25,000 scale
All shoreline that is not
shown on the NOS compilation
overlay will be mapped as
apparent shoreline.

Selection at 1:100,000 scale Show all shoreline that is not on the NOS compilation overlay as apparent shoreline. (Plate 141, symbol no. 2)

3.10.1.3 Sounding Datum Line

The sounding datum line is the plane of reference for soundings. It is the stage of low tide (mean lower low water) to which depths are referenced.

1:24,000 and 1:25,000 scale
All sounding datum lines shown on the NOS compilation overlay are mapped.

Selection at 1:100,000 scale Show all sounding datum lines that are on the NOS compilation overlay. (Plate 141, symbol no. 40)

3.10.1.4 Area Between Shoreline and Sounding Datum Line

Area between shoreline and sounding datum line is the area between

mean lower low water (sounding datum line) and high tide.

1:24,000 and 1:25,000 scale
All areas between shoreline
and sounding datum line shown
on the NOS compilation overlay
are mapped.

Selection at 1:100,000 scale Show all areas between shoreline and sounding datum line that are on the NOS compilation overlay. (Plate 135, symbol no. 7)

3.10.2 Bathymetric Contours

Bathymetric contours are shown for coastal and navigable water areas whenever the data is available from NOS. Bathymetric contours should not be confused with underwater contours shown in areas submerged by dams. A bathymetric contour is a line connecting points of equal depth with reference to the sounding datum. The datum is mean lower low water. See Tables 3.10-1 and 3.10-2.

Labels required for bathymetric contours are on Plate 114.

3.10.2.1 Index Primary Contours

Contours at 250-meter intervals are referred to by NOS as "Index Contours."

1:24,000 and 1:25,000 scale All index primary contours shown on NOS compilation overlay are mapped. Selection at 1:100,000 scale Show all index primary contours that are on NOS compilation overlay. (Plate 112, symbol no. 87)

3.10.2.2 Primary Contours

Contours at 50-meter intervals except for the 250-meter index primary contours (3.10.1.1).

1:24,000 and 1:25,000 scale
All primary contours shown on
the NOS compilation overlay
are mapped.

Selection at 1:100,000 scale Show all primary contours that are on the NOS compilation overlay. (Plate 112, symbol no. 88)

3.10.2.3 Approximate Primary Contours

Approximate primary contours are used in limited areas where compilation of contours to reasonable accuracy is not feasible.

1:24,000 and 1:25,000 scale
All approximate primary
contours shown on the NOS
compilation overlay are
mapped.

Selection at 1:100,000 scale Show all approximate primary contours that are on the NOS compilation overlay. (Plate 112, symbol no. 89)

3.10.2.4 Depression Primary Contours

Depression primary contours are used to depict closed areas surrounded by higher areas, such as a basin or sink.

1:24,000 and 1:25,000 scale
All depression primary
contours shown on the NOS
compilation overlay are
mapped. Show ticks on the
bottom contour only.

Selection at 1:100,000 scale Show all depression primary contours that are on the NOS compilation overlay. Show ticks on the bottom contour only. (Plate 112, symbol no. 90)

3.10.2.5 Rise Primary Contours (inside depressions)

Rise contours are inside depression contours and indicate areas that are rising above the depression.

1:24,000 and 1:25,000 scale
All rise primary contours
shown on the NOS compilation
overlay are mapped. Show
ticks on the bottom contour
only.

Selection at 1:100,000 scale Show all rise primary contours that are on the NOS compilation overlay. Show ticks on the bottom contour only. (Plate 112, symbol no. 91)

3.10.2.6 Index Contours

Index contours, every fifth line except for the 250-meter index primary contours (3.10.2.1) and the 50-meter primary contours (3.10.2.2), serve as a visual reference framework for the bathymetry.

1:24,000 and 1:25,000 scale
All index contours shown on
the NOS compilation overlay
are mapped. The interval is 5
meters to the 200-meter depth
along the Atlantic coast below
42°, the Gulf of Mexico, and
Alaska morth of the Aleutians.

Selection at 1:100,000 scale Show all index contours that are on the NOS compilation overlay. The interval is 10 meters to the 200-meter depth along the Atlantic coast below 42°, the Gulf of Mexico, and Alaska north of the Aleutians. (Plate 141, symbol no. 41)

The interval is 10 meters to the 200-meter depth along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. No index contours are shown along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians.

3.10.2.7 Intermediate Contours

Intermediate contours are additional contours at 2- or 10-meter intervals to the 200-meter depth except for the 50-meter primary contours (3.10.2.2) and the index contours defined in 3.10.2.6.

1:24,000 and 1:25,000 scale
All intermediate contours
shown on the NOS compilation
overlay are mapped. The
interval is 1 meter to the
200-meter depth along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

The interval is 2 meters to the 200-meter depth along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. Selection at 1:100,000 scale
Show all intermediate contours
that are on the NOS
compilation overlay. The
interval is 2 meters to the
200-meter depth along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.
(Plate 141, symbol no. 42)

The interval is 10 meters to the 200-meter depth along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. (Plate 141, symbol no. 41)

3.10.2.8 Approximate Contours

Approximate contours are used in limited areas where compilation of index or intermediate contours to reasonable accuracy standards is not feasible.

1:24,000 and 1:25,000 scale
All approximate contours shown on the NOS compilation overlay are mapped.

Selection at 1:100,000 scale Show all approximate contours that are on the NOS compilation overlay. (Plate 141, symbol no. 43)

3.10.2.9 Supplementary Contours

Supplementary contours are used to provide detail in flatter ocean areas.

1:24,000 and 1:25,000 scale
All supplementary contours on
the NOS compilation overlay
are mapped. The interval is
0.5 meters to the 200-meter
depth and 10 meters below the
200-meter depth along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

The interval is odd 2 meters contours to the 200-meter depth and 10 meters below the 200-meter depth along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians.

Selection at 1:100,000 scale
Show all supplementary
contours that are on the NOS
compilation overlay. The
interval is odd 2 meter
contours to the 200-meter
depth and 10 meters below the
200-meter depth along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.
(Plate 112A, symbol no. 1;
plate 141, symbol no. 41)

The interval is 2 meters to the 200-meter depth and 10 meters below the 200-meter depth along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. (Plate 141, symbol nos. 42 and 41)

3.10.2.10 Approximate Supplementary Contours

Approximate supplementary contours are used in limited areas where the compilation of supplementary contours to reasonable accuracy standards is not feasible.

1:24,000 and 1:25,000 scale
All approximate supplementary
contours shown on the NOS
compilation overlay are
mapped.

Selection at 1:100,000 scale
Show approximate supplementary
contours along the Atlantic
coast below 42°, the Gulf of
Mexico, and Alaska north of
the Aleutians.
(Plate 141, symbol no. 43;
plate 112A, symbol no. 4)

3.10.2.11 Depression Contours

Depression contours are used to depict closed areas that are surrounded by higher areas, such as a basin or sink.

1:24,000 and 1:25,000 scale All depression contours shown on the NOS compilation overlay are mapped. Selection at 1:100,000 scale Show all depression contours that are on the NOS compilation overlay. (Plate 141, symbol no. 44)

3.10.2.12 Supplementary Depression Contours

Supplementary depression contours are used to depict closed areas surrounded by higher land, such as a basin or sink in the flatter ocean areas to the 200-meter depth.

1:24,000 and 1:25,000 scale
All supplementary depression
contours shown on the NOS
compilation overlay are
mapped. Show ticks on the
bottom contour only.

Selection at 1:100,000 scale Show all supplementary depression contours that are on the NOS compilation overlay. Show ticks on the bottom contour only. (Plate 112A, symbol no. 2; plate 141, symbol no. 44)

3.10.2.13 Rise Contours (inside depressions)

Rise contours are inside depression contours and indicate areas that are rising above the depression.

1:24,000 and 1:25,000 scale
All rise contours shown on the
NOS compilation overlay are
mapped.

Selection at 1:100,000 scale Show all rise contours that are on the NOS compilation overlay. Show ticks on the bottom contour only. (Plate 141, symbol no. 45)

3.10.2.14 Supplementary Rise Contours (inside depressions)

Supplementary rise contours are inside depression contours and indicate areas that are rising above the depression.

1:24,000 and 1:25,000 scale All supplementary rise contours shown on the NOS compilation overlay are mapped. Selection at 1:100,000 scale
Show all supplementary rise
contours that are on the NOS
compilation overlay. Show
ticks on the bottom contour
only.

(Plate 1124 symbol no 3:

(Plate 112A, symbol no. 3; plate 141, symbol no. 45)



3.10.3 <u>Bathymetric Features</u>

Manmade features or natural obstructions in offshore areas.

3.10.3.1 Inadequate Survey Area and Holiday Area

Inadequate survey areas and holiday areas are areas where compilation either fails to meet minimum requirements or is nonexistent.

1:24,000 and 1:25,000 scale
All inadequate survey areas
and holiday areas shown on the
NOS compilation overlay are
mapped.

Selection at 1:100,000 scale Show all inadequate survey areas and holiday areas that are on the NOS compilation overlay. (Plate 112, symbol no. 93)

3.10.3.2 Channels

Channels are dredged passages in a river, bay, lake, or harbor for navigable purposes.

1:24,000 and 1:25,000 scale
All channels shown on the NOS compilation overlay are mapped.

Selection at 1:100,000 scale Show all channels that are on the NOS compilation overlay. (Plate 112, symbol no. 94)

3.10.3.3 Spoil Area

Spoil areas are locations used for refuse dumping and are subject to frequent change. These areas do not contain bathymetric contours.

1:24,000 and 1:25,000 scale All spoil areas shown on the NOS compilation overlay are mapped.

Selection at 1:100,000 scale Show all spoil areas that are on the NOS compilation overlay. (Plate 112, symbol no. 95)

3.10.3.4 Submerged Jetty

A submerged jetty is a structure projecting into a body of water to influence the current or tide or to protect a harbor or shoreline; its top is below the hydrographic datum.

1:24,000 and 1:25,000 scale
All submerged jettys shown on
the NOS compilation overlay
are mapped.

Selection at 1:100,000 scale Show all submerged jettys that are on the NOS compilation overlay. (Plate 112, symbol no. 96)

3.10.3.5 Rock, Bare or Awash

Rock, bare or awash, are single rocks that are exposed at any stage of the tide.

1:24,000 and 1:25,000 scale All rocks, bare or awash, shown on the NOS compilation overlay are mapped. Selection at 1:100,000 scale Show all rocks, bare or awash, that are on the NOS compilation overlay. (Plate 112, symbol no. 97)

3.10.3.6 Group of Rocks, Bare or Awash

Groups of rocks, bare or awash, are many rocks together that are exposed at any stage of the tide.

1:24,000 and 1:25,000 scale
All groups of rocks, bare or
awash, shown on the NOS
compilation overlay are
mapped.

Selection at 1:100,000 scale Show all groups of rocks, bare or awash, that are on the NOS compilation overlay. (Plate 112, symbol no. 98)

3.10.3.7 Sunken Rock

Sunken rocks are rocks below the hydrographic datum.

1:24,000 and 1:25,000 scale All sunken rocks show on the NOS compilation overlay are mapped. Selection at 1:100,000 scale
Show all sunken rocks that are
on the NOS compilation
overlay.
(Plate 112, symbol no. 99)

3.10.3.8 Rock Reef and Coral Reef

Rock reefs are rock ledge formations that are usually connected with and fringing the shoreline. Coral reefs are coral formations that are usually detached from the shoreline.

1:24,000 and 1:25,000 scale
All rock reefs and coral reefs
shown on the NOS compilation
overlay are mapped.

Selection at 1:100,000 scale Show all rock reefs and coral reefs that are on the NOS compilation overlay. (Plate 112, symbol no. 100)

3.10.3.9 Oil and Gas Well

Oil and gas wells are holes drilled or bored into the ocean bottom to obtain petroleum products.

1:24,000 and 1:25,000 scale
All oil and gas wells shown on
the NOS compilation overlay
are mapped.

Selection at 1:100,000 scale Show all oil and gas wells that are on the NOS compilation overlay. (Plate 112, symbol no. 101)

3.10.3.10 Light

Lights are stationary beacons used to mark channels or obstructions.

1:24,000 and 1:25,000 scale All lights shown on the NOS compilation overlay are mapped. Selection at 1:100,000 scale Show all lights that are on the NOS compilation overlay. (Plate 112, symbol no. 102)

3.10.3.11 Oil and Gas Platform

Oil and gas platforms are raised structures equipped for the extraction of petroleum products from the ocean floor.

1:24,000 and 1:25,000 scale All oil and gas platforms shown on the NOS compilation overlay are mapped. Selection at 1:100,000 scale
Show all oil and gas platforms
that are on the NOS
compilation overlay.
(Plate 116, symbol no. 11)

3.10.3.12 Submerged Pipeline

Submerged pipelines are closed conduits used to convey gases or liquids below the hydrographic datum.

1:24,000 and 1:25,000 scale
All submerged pipelines shown
on the NOS compilation overlay
are mapped.

Selection at 1:100,000 scale
Show all submerged pipelines
that are on the NOS
compilation overlay. Add flow
direction dots where flow
direction is known.
(Plate 116, symbol no. 12)

3.10.3.13 Submerged Sewer lines

Submerged sewer lines are sewer lines below the hydrographic datum.

1:24,000 and 1:25,000 scale All submerged sewer lines shown on the NOS compilation overlay are mapped. Selection at 1:100,000 scale Show all submerged sewer lines that are on the NOS compilation overlay. Add flow direction dots where flow direction is known. (Plate 116, symbol no. 13)

3.10.3.14 Exposed Wreck

Exposed wreck is a wreck that has any portion of the hull or superstructure above the hydrographic datum.

1:24,000 and 1:25,000 scale All exposed wrecks shown on the NOS compilation overlay are mapped. Selection at 1:100,000 scale Do not show exposed wrecks.

3.10.4 <u>Bathymetric Gradient Tints</u>

Bathymetric gradient tints are different shades of blue with a green overprint that depict differences in water depth.

3.10.4.1 Bathymetric Overprint

Bathymetric overprint is used for water areas from the sounding datum line (3.10.1.14) to the maximum depth.

1:24,000 and 1:25,000 scale
All bathymetric overprint from
the sounding datum line to the
maximum depth is mapped.

Selection at 1:100,000 scale Show all of the bathymetric overprint from the sounding datum line to the maximum depth. (Plate 157, symbol no. 1)

1:24,000 and 1:25,000 scale
Show gradient tint # 1, 0- to
the 5-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 1, 0- to the 50-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. Selection at 1:100,000 scale
Show gradient tint # 1, 0- to
the 20-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 1, 0- to the 100-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. (Plate 145A, symbol no. 1)

1:24,000 and 1:25,000 scale
Show gradient tint # 2, 5- to
the 10-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 2, 50- to 100-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians.

Selection at 1:100,000 scale
Show gradient tint # 2, 20- to
the 40-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 2, 100to the 200-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. (Plate 145B, symbol no. 1)

1:24,000 and 1:25,000 scale
Show gradient tint # 3, 10- to
the 15-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 3, 100to the 150-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. Selection at 1:100,000 scale
Show gradient tint # 3, 40- to
the 60-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 3, 200to the 500-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. (Plate 145C, symbol no. 1)

1:24,000 and 1:25,000 scale
Show gradient tint # 4, 15- to
20- meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 4, 150to 200-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. Selection at 1:100,000 scale
Show gradient tint # 4, 60- to
80-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 4, 500to 1000-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. (Plate 145D, symbol no. 1)

1:24,000 and 1:25,000 scale
Show gradient tint # 5, 20-to
25-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 5, 200to 250-meter depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. Selection at 1:100,000 scale
Show gradient tint # 5, 80- to
100-meter depth, along the
Atlantic coast below 42°, the
Gulf of Mexico, and Alaska
north of the Aleutians.

Show gradient tint # 5, 1000 meters to the maximum depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians. (Plate 145E, symbol no. 1)

> 1:24,000 and 1:25,000 scale Show gradient tint # 6, 25- to 50-meter depth, along the Atlantic coast below 42°, the Gulf of Mexico, and Alaska north of the Aleutians.

> Show gradient tint # 6, 250 meters to the maximum depth, along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians.

Selection at 1:100,000 scale
Show gradient tint # 6, 100to the 200-meter depth, along
the Atlantic coast below 42°,
the Gulf of Mexico, and Alaska
north of the Aleutians.
(Plate 145F, symbol no. 1)

Do not show gradient tint # 6 along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians.

1:24,000 and 1:25,000 scale
Show gradient tint # 7, 50
meters to the maximum depth,
along the Atlantic coast below
42°, the Gulf of Mexico, and
Alaska north of the Aleutians.

Do not show gradient tint # 7 along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians.

Selection at 1:100,000 scale
Show gradient tint # 7, 200
meters to the maximum depth,
along the Atlantic coast below
42°, the Gulf of Mexico, and
Alaska north of the Aleutians.
(Plate 145G, symbol no. 1)

Do not show gradient tint # 7 along the Atlantic coast above 42°, the Pacific coast, and Alaska south of the Aleutians.

Table 3.10-1

Atlantic Coast below 42°, Gulf of Mexico, and Alaska north of Aleutian Islands

| Contour Type | 1:24,000/1:25,000 Scale | 1:100,000 Scale |
|---------------|---|--|
| Index Primary | 250, 500, 750, 1000, to maximum depth | 250, 500, 750, 1000, to maximum depth |
| Primary | 50, 100, 150, 200, 300, 350, to maximum depth | 50, 100, 150, 200, 300, 350, to maximum depth |
| Index | 5, 10, 15, 20, 25, 30, 35, to 200 m | 10, 20, 30, 40, 60, 70, to 200 m |
| Intermediate | 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, to 200 m | 2, 4, 6, 8, 12, 14, 16, 18, 22, to 200 m |
| Supplementary | 0.5, 1.5, 2.5, 3.5, 4.5, 5.5, 6.5, to 200 m 210, 220, 230, 240, 260, 270, to maximum depth | 1, 3, 5, 7, 9, 11, 13, 15, 17, to 200 m 210, 220, 230, 240, 260, 270, to maximum depth |

Gradient Tints

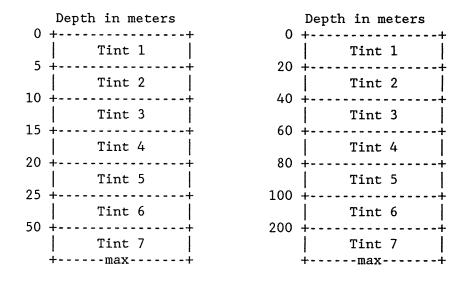
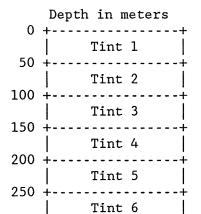


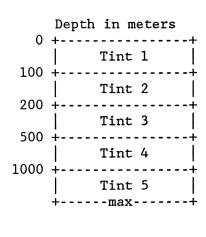
Table 3-2

Atlantic Coast above 42°, Pacific Coast, and Alaska south of Aleutian Islands

| Contour Type | 1:24,000/1:25,000 Scale | 1:100,000 Scale |
|----------------|--|--|
| Index Primary | 250, 500, 750, 1000, 1250, 1500, to maximum depth | 250, 500, 750, 1000, 1250, 1500, to maximum depth |
| Primary | 50, 100, 150, 200, 300, 350, to maximum depth | 50, 100, 150, 200, 300, 350, to maximum depth |
| Index | 10, 20, 30, 40, 60, 70, 80, to 200 m | N/A |
| Intermediate | 2, 4, 6, 8, 12, 14, 16, 18, 22, to 200 m | 10, 20, 30, 40, 60, 70, 80, to 200 m |
| Supplementary | 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21 to 200 m 210, 220, 230, 240, 260, 270, to maximum depth | 2, 4, 6, 8, 12, 14, 16, 18, 22, to 200 m 210, 220, 230, 240, 260, to maximum depth |
| Gradient Tints | | |



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3.11 FEATURE SEPARATION LIST

| Plate Number | Feature Separate | Screen / Pattern | Combined Negative |
|-----------------|---|-------------------------|----------------------|
| 111 | Projection and State Grid | N/A | 1-Black |
| 112 | Miscellaneous Culture and Bathymetry | N/A | 1-Black |
| 112A | Bathymetric Supplementary Contours | 30% 150-line Biangle | 1-Black |
| 113 | UTM grid | N/A | 1-Black |
| 114 | Type for interior and margin labels | N/A | 1-Black |
| 114A | Type for civil townships and bathymetric features | 50% 150-line Biangle | 1-Black |

| Plate Number | Feature Separate | Screen / Pattern | Combined Negative |
|-----------------|---|-------------------------|----------------------|
| 115 | Built-up area tint | 8% 120-line @ 105° | 1-Black |
| 116 | Roads, airports, and bathymetric features | 50% 150-line Biangle | 1-Black |
| | -Roads and related features -Offshore platforms and pipelines -Airports | | |
| 121* | Highways and related features | 30% 150-line Biangle | 1-Black |
| | -Highways -Highway-related features | | |
| 121* | Highways and related features | N/A | 2-Red |
| | -Highways -Highway-related features | | |
| 123 | Land net | 50% 150-line Biangle | 2-Red |
| | -Public Land Survey System -Other land lines | | |
| 124 | Type for highways, roads, and land net | N/A | 2-Red |
| | -Highway and road route markers -Land net names and labels | | |
| 125 | Offshore protractions | 50% 150-line Biangle | 2-Red |
| 126 | Type for offshore protractions | 50% 150-line Biangle | 2-Red |

^{*} Separate 121 is printed 100% Red, also 30% black.

| Plate Number | Feature Separate | Screen / Pattern | Combined Negative |
|-----------------|---|-------------------------|----------------------|
| 132 | Contours | N/A | 3-Brown |
| | -Contours -Contour-related features | | |
| 133 | Supplementary contours | 30% 150-line Biangle | 3-Brown |
| 134 | Sand and gravel areas | Pattern USGS 17 | 3-Brown |
| 135 | Disturbed surfaces and bathymetry | 13% 120-line @ 105° | 3-Brown |
| | -Mines, pits, and lava flows -Intertidal zone -Reef fill | | |
| 136 | Type for contour values and quadrangle name | N/A | 3-Brown |
| | -Contour values -Quadrangle name | | |
| 141 | Drainage and bathymetric contours | N/A | 4-Blue |
| | -Streams and shorelines -Lakes and ponds -Canals and aqueducts -Wells and springs -Glaciers and permanent snowfields -Rapids and waterfalls -Submerged areas and bogs -Land subject to inundation -Bathymetric contours | | |
| 142 | Type for hydrographic features | N/A | 4-Blue |



| | | T | T . |
|-----------------|------------------------------|------------------------|----------------------|
| Plate Number | Feature Separate | Screen / Pattern | Combined Negative |
| 143 | Marsh and swamp fill | Pattern USGS 2 | 4-Blue |
| 144 | Mangrove fill | Pattern USGS 25 | 4-Blue |
| 145 | Perennial water fill | 8% 120-line @ 105° | 4-Blue |
| 145A | Bathymetric gradient tint #1 | 8% 120-line @ 105° | 4-Blue |
| 145B | Bathymetric gradient tint #2 | 13% 120-line @ 105° | 4-Blue |
| 145C | Bathymetric gradient tint #3 | 20% 120-line @ 45° | 4-Blue |
| 145D | Bathymetric gradient tint #4 | 30% 120-line @ 45° | 4-Blue |
| 145E | Bathymetric gradient tint #5 | 40% 120-line @ 75° | 4-Blue |
| 145F | Bathymetric gradient tint #6 | 50% 120-line @ 60° | 4-Blue |
| 145G | Bathymetric gradient tint 7 | 60% 120-line @ 45° | 4-Blue |
| 146 | Inundation fill | Pattern USGS AP-9B | 4-Blue |
| 147 | Intermittent water fill | Pattern LP-8B | 4-Blue |



| Plate Number | Feature Separate | Screen / Pattern | Combined Negative |
|-----------------|-----------------------|-----------------------|----------------------|
| 152 | Woods and mangrove | 40% 120-line @ 75° | 5-Green |
| 154 | Scrub | Pattern USGS 20B | 5-Green |
| 155 | Orchard | Pattern USGS 26B | 5-Green |
| 156 | Vineyard | Pattern USGS 7B | 5-Green |
| 157 | Bathymetric overprint | 8% 120-line @ 60° | 5-Green |

